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THE TEACHING OF HIGH SCHOOL SUBJECTS

THE
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THE TEACHING OF HIGH SCHOOL SUBJECTS

BY
WILLIAM A. MILLIS
HARRIETT H. MILLIS

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EDITOR'S INTRODUCTION

One of the outstanding features of educational development in the United States during the last thirty years has been the relatively enormous growth in the number of high schools and in the attendance at these schools. This has resulted in a corresponding increase in the number of teachers employed in secondary education. These high school teachers are recruited at the present time not mainly from the large universities with highly specialized courses in Education, but largely from the smaller colleges and the normal schools and teachers' colleges. In most of these institutions there is no opportunity for a large number of courses dealing specifically with the problems of secondary education. In fact, in many of the colleges it is somewhat difficult for the institutions to offer courses which more than meet the North Central Association requirements or the professional requirements of other similar organizations, or to meet the minimum amount of professional training required by the respective states for the legal certificate to teach. The question of the type of professional instruction to be given in such institutions is, therefore, a serious one. There seems to be a need for a course which deals in an elementary way with specific suggestions for the teaching of the various high school subjects. The great majority of our young people who go into

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secondary school work find that they must undertake to teach more than one subject. The high degree of specialization which is desired in the larger high schools is not infrequently absolutely impracticable in the small high schools. A textbook, therefore, which deals with the methods of teaching these various subjects in an elementary way should meet a very real need in Education. President Millis has had many contacts with secondary education, both in his capacity as president of a college and as an instructor in Education. During this time he has been face to face with the specific difficulties of these teachers. His presentation of the high school problem is one which cannot fail to be of great benefit to a large group of beginning high school teachers. It is primarily to meet the need of the normal schools and smaller colleges that this book has been prepared. It is also expected that a large number of teachers actually in the field of secondary education may find the suggestions in this volume stimulating and helpful.

PREFACE

The aim of this volume is to supply teacher training institutions with a discussion of the high school problem, suitable as a text in the general methods class for those students who are preparing specially for high school teaching, and also to supply teachers in service with a guide to further professional study. It is the outgrowth of some thirty years' experience in supervision of high school instruction and the training of secondary teachers. The effort has been to put in concise and intelligible form those concepts of objective, principle, and method which this experience has shown to be the primary need of the young teacher. The content of the volume has been elaborated from notes of a course of lectures which have been delivered many times at Indiana University, and Wabash and Hanover Colleges. All of the devices and methods suggested have been tested out in actual school room practice.

It is not the thought of the writers that the present treatise comprises all of the material necessary in the training of the secondary teacher. The book is meant to be introductory to the more special courses in method which will be required. It is their thought that all teachers should have a general introductory course covering the entire field of high school instruction. There are three reasons for this view.

First, the majority of secondary teachers are employed in the smaller schools. In these smaller schools, serving the majority of the population, the instructors are called on to teach in two or three, and even more, departments. They need preparation for this contingency. The generally prevailing practice of training schools to concentrate effort on the making of specialists is the source of serious weakness in the small schools. The second reason is that possibly more than half of the high school teachers, especially in the Middle West, at some time during their teaching career serve in administrative capacities, and should have the broad general outlook upon the high school problem in order rightly to relate the various factors in the situation. Third, the departmental teacher needs this same command of the whole field of the secondary school in order rightly to comprehend and relate her own particular field. To follow this general introductory course with the usual special methods courses will add greatly to the efficiency of high school administration and instruction.

The point of view of the book is that first promulgated by Stanley Hall, viz., that the training of the adolescent is at the same time the most difficult and, educationally and socially, the most significant part of the entire educational effort. The rise of the American high school is the outstanding fact of our later educational history. It is the most typically American of all of our schools. The quality of the work which it does is of the utmost importance to the welfare of our institutions. It has in its keeping the direction of the individual in the most critical period

of his development. The social importance of secondary education and the psychological problems with which it must deal, combine to make the high school problem the most urgent issue of educational thought.

The discussion also proceeds from the notion that high school education should be thoroughly democratic. Its first fruit should be those qualities of mind and heart which constitute the essential elements in good citizenship. The high school should be so organized and administered that its pupils may secure a truly democratic experience, involving practice in self-direction, intelligent insights into the functions and values of social institutions, and training in independent thinking and wise choosing. Much should be made of appreciation as distinguished from mere scholarship, and constant effort put forth to develop in the pupil those attitudes which will start him out upon proper levels of conduct and in right directions.

The writers realize that the treatment of no topic is exhaustive. They are content rather to state the problems and suggest the lines of thought which have been found profitable. If they have succeeded in accomplishing this they feel amply rewarded for their effort.

William A. Millis.
Harriett H. Millis.

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THE TEACHING OF HIGH SCHOOL SUBJECTS

THE TEACHING OF HIGH SCHOOL SUBJECTS

CHAPTER I

FUNCTIONS OF THE HIGH SCHOOL

The administration of secondary schools and the methods of teaching high school subjects properly involve the consideration of four factors in the high school situation.

I. The functions of the high school as a social institution.
II. The educational values implicit in the materials of instruction.
III. The mental processes involved in the study of these subjects.
IV. The methods which must be employed in order to realize desired values, as determined by the mental processes, together with the devices and equipment available.

I. Social Functions

The twofold origin of the high school—The high school is rooted on the one hand in the college preparatory school which sometimes was maintained in connection with the college, sometimes as an independent

school, but administered primarily if not solely for the purpose of fitting the pupil for college entrance. On the other hand the high school has developed out of the elementary school, thus completing the task which year by year grew too large for the common school. In some communities this secondary school took the form of an independent seminary or academy, private or public, whose purpose was to give the higher training which the growing community demanded. Quite generally the new institution grew out of the prolongation of the common school. First one or two additional years of instruction were provided; later a third and fourth, in order to afford time for newer branches of learning which the people came to feel were necessary for the adequate training of the youth.

Finishing versus fitting school—The preparatory school was admittedly a fitting school; the academy or seminary a finishing school. The former concentrated on those subjects prescribed for admission to college, and omitted from its program many studies of value to the youth in view of the fact that he would have the opportunity to pursue them in subsequent years. The finishing school naturally attempted a more extensive and frequently ambitious program because of the desire to bring to bear upon the pupil during the secondary period all lines of training essential to his adequate preparation for citizenship. The preparatory school was more concerned with mental discipline and looked rather to the ultimate values to be secured in college study. These the intensive training of the fitting school made possible. On the other hand the finishing school was more concerned with immediate

values in the form of a wide but necessarily superficial culture and that training which would be immediately helpful in the practical life of the pupil.

Conflicting functions of modern high school—The combination of these two types into the modern high school has presented to the administrator an exceedingly difficult problem—the management of an institution having two functions to perform, in all respects conflicting and in some mutually exclusive. The public demands of the high school that at the same moment, and generally in the same classroom, it shall serve two classes of students; the small number who are preparing for college, and the larger number who expect to end their formal education with the completion of their present course of study. In the larger schools these conflicting interests are met by the provision of parallel courses of which the pupil is granted his choice, but even in these the differentiation is often more apparent than real. For many years in the smaller schools the interest of the college preparatory group was given the preference, leading at last to a vigorous reaction which in too many instances has resulted in the sacrifice of the minority. In the effort to secure justice to the ninety-eight per cent who do not expect to attend college the welfare of the two per cent who will go on to the higher schools is jeopardized, and in many cases the standard of the college lowered because of the inadequate preparation of the high school product. This is particularly true in the older subjects of mathematics, English and foreign language.

Types of pupils to be served—Clearly it is unfair to neglect the interest of the majority of the high school

pupils in order to send on the few well prepared for college entrance. And as clearly it is unfair to sacrifice this ambitious and promising minority in order to conserve the welfare of the majority. The safeguarding of both classes of students is the problem. And it is not solved by the recent assumption that "preparation for life is a satisfactory preparation for college." The results have not justified this assumption. There is a real diversity of interest which can not properly be ignored. In a democratic society it is imperative that the masses have the fullest possible introduction to the culture of the race,—its history, its literature, and its art. But it is equally imperative that there be a highly trained leadership. To neglect the culture of the masses results in tyranny; but to neglect the development of a highly trained leadership is to invite anarchy. To emphasize either type of education to the detriment of the other would be suicidal. Hence the high school must continue to perform both functions if it is to contribute to the maintenance of a real, dynamic American democracy.

Provision for the gifted few—If we are to have a real democracy, the gifted few must have the opportunity and be encouraged to press on for the higher training which will enable them to render that expert service which a dynamic society must have. While the prosperity and stability of the social order rests upon the general intelligence of the masses, the streams of progress have their origin in remote mountain springs of sound special scholarship. To deprive a state of its scholars, its great artists, its poets, its inventors, its experts on the picket line of research, is to invite

certain disaster. The story of human progress is the story of Plato, Aristotle, Bacon, Darwin, Faraday, Helmholtz, the story of the philosophers and poets, of the naturalists and economists, the mathematicians and historians, of the great scholars and artists who blazed out the way for the common man. The nation which most encourages high scholarship becomes the leader among nations. The people who through a mistaken conception of democracy strive to keep all persons down to the level of the "greater number" cut the connection with the nerve center of rational initiative. They are like a crew without a captain. This is a principle well understood by all successful nation builders. They lay strong and deep the foundations of their colleges and universities. To this principle democracies as well as empires must conform.

Training for leadership—Further, a stable democracy must have a safe leadership. The outstanding lessons of the Great War are two; first, that pure scholarship, great learning, the results of scientific research, are the most priceless possessions of a people; second, that the fate of a nation is determined by the quality of its leadership. Adequate leadership, if anything, is more essential in a democracy than in other forms of society. The common man is the ready prey of half-truths, illusions, and falsehoods. His judgment is not critical; he does not possess the requisite scholarship for a proper conception of situations. He thus is in constant danger of a social stampede. The common man is disposed to accept without question the suggestion of rumor and newspaper report.

Because of this childlike trait of mind he is the easy victim of the propagandist. He is merely one of the latter's public, ready to accept as true any statement made with sufficient vigor and the show of earnestness. On the other hand the ignorant man lacks the scholarship necessary for a critical reaction. He can not combat ideas without an adequate equipment of fact. He can not evaluate men or measures without proper knowledge of other men and measures. Lacking this scholarship and the critical habit of mind, he is helpless before the onrush of panic and craze except for the presence in the group of individuals of superior intelligence and training. A public is much like a beach whose shore-line is protected by great piles driven into the sands at frequent intervals to break the force of onrushing waves. The superior individual is a breakwater upon whom the waves of unwarranted public enthusiasm, baseless panics, class passions, fads and crazes, are lashed to pieces and the damage they would do forestalled. He is the protector of the people from their own folly, as well as their leader. The welfare of the group requires that it shall have within it at least a number of individuals who possess not only this superior ability, but also the power to radiate their judgment and will throughout the group. But for the restraining and guiding influence of such superior individuals the democratic group would speedily degenerate into an aimless mob. William Lowe Bryan has defined democracy as that form of society which opens an unobstructed path before each boy and girl in the commonwealth, leading up to the highest attainments of man at his best, and upon

which the youth shall be encouraged to travel to the limit of his capabilities. Any policy of school administration which obstructs this pathway is undemocratic. Any policy which discourages or prevents the fullest realization of the most gifted pupils is ultimately disastrous to the community.

Training for general intelligence—But the necessity of providing for the minority must not obscure the equal necessity of provision for the adequate training of the many who will end their educational career with the high school. The scope of training required for the satisfactory equipment of the masses is increasing year by year. Much that was once considered as ornamental and the prerogative of the privileged few is now commonplace in the life of the majority. Sixty years ago the voter who could discern the right and wrong of human slavery was adequately equipped to cast an intelligent ballot. In our day voters in presidential elections are asked to express judgment on systems of taxation, the government of foreign colonies, policies of fiscal administration, the management of public utilities, international relations and numerous other political and economic problems, which to be an intelligent judgment requires a knowledge of history, economics, and political science wholly confined a few years ago to the college professor. If the ballot of the present and future is to be as intelligent as the ballot of 1860, the school must bring to the masses a scholarship unknown to the average citizen two generations ago. The development of farm machinery makes the elements of physics and chemistry a commonplace necessity to the farm boy. The new food

and clothing problems make the training in the domestic arts formerly given in the home wholly inadequate. To understand the advice of the family physician requires a knowledge of the principles of biology and sanitary science which were not discovered in the days of our grandfathers. In order to enjoy fully the means of entertainment and the social intercourse of the present day requires a knowledge of art, music and literature far beyond the requirements of former years. This means that we must offer a vastly enriched source of study, and that the high school curriculum must continue to expand. The community which fails to make such provision for increasing culture of all the youth must speedily fall out of step with the times.

Reorganization of secondary education—The most prominent social movement of the last two decades is the effort to democratize the high school. The movement has involved considerable experimentation with various plans of organization, curriculum, and classroom methods. This experimentation has developed a number of aspects which promise to be permanent additions to the secondary program and a re-thinking of the entire problem involved which is already productive of larger insights and a more vitalizing conception. The most significant of these new conceptions is that the high school must bring to each pupil, whatever his social or economic or mental status, the opportunity to engage in those lines of study and participate in those varieties of experience which will contribute to the fullest realization of his capacities for wholesome, happy and useful living. The point of

view involved is that the high school is the highway along which all the youth may travel, each at his own gait, and each going as far as his own abilities and social situation may determine. Some, blessed with fine abilities, will travel this highway on up and through college and university out upon the higher and broader fields of activity. Others less favored by nature will leave at the end of the highway for the middle ground levels of life; while very many others of limited ability will take to the side roads after one or two or three years. It is the duty of the high school to make provision for each of these types, and such provision that the individual shall find it easier to live the life into which he settles, to be truly useful, and to be a better man in and of himself for the time he spent in school. This responsibility of the secondary school is expressed thus in the language of "The Commission on Secondary Education": "The school should admit and provide suitable instruction for all pupils who are in any respect so mature that they would derive more benefit from the secondary school than from the elementary school."

Another conception developed in this re-thinking of the secondary school problem, which possibly is equally vital, is that in addition to imparting a body of information and training pupils in certain skills, the secondary school is responsible for giving its pupils those emotional experiences which result in proper appreciation and attitudes on the part of the individual toward his own life as well as toward the persons, institutions and things which constitute his environment. It is one thing to possess knowledge and skill; it is quite

another to know when and for what to use them. The school must not only become democratic, but it must go far enough in its reorganization to make its product "safe for democracy."

It is not the purpose of this book to go into the question of curriculum making farther than to discuss the principles which must be observed. The matter at present is, with regard to many details, in an experimental stage. It is to be hoped that experimentation may be continued long enough to get a true precipitate. Some general principles, however, are clearly established. First of these is the principle of organization which underlies what is known as the "six-three-three plan," involving the conception that the public school system covers three cycles of education; the elementary, the intermediate and the secondary. The plan holds that these cycles differ sharply as to their physical, mental and social factors, so much so as to require separate units of administration. The second and third cycles are assigned to the junior and senior high schools. The democratization of secondary education is quite largely accomplished by this extension of the field to include the seventh to twelfth years, by its division between the junior and senior high schools as separate units, and by the organization of the intermediate cycle of instruction and experience as included in the program of the junior high school.

The organization of the junior high school as a separate administrative unit greatly simplifies the problem of the senior high school. The student body will be more mature and of better grade of ability. Much of the general training of pupils will have been

accomplished. The senior high school may therefore organize its curriculum with greater definiteness. There is general agreement that its program must satisfy the following requirements:

1. It will provide, so far as the resources of the school permit, continuous courses in each of the departments of learning: English, Foreign Language, Mathematics, Natural Science, Social Science; and also in Health, Guidance, Practical and Fine Arts.

2. The academic courses will be definitely specialized.

3. The practical arts will be definitely vocational.

4. The fine arts courses will be organized to serve two classes of pupils. For one class they will be specialized with the development of skill as the end in view; for the majority they will be presented with the aim to cultivate appreciation.

5. The program of studies will be organized as a unified curriculum in which a small number of constants are prescribed, other subjects being optional with a loose grouping corresponding to the three mental types of pupils, the intellectual, the artistic, and the practical.

6. The program of the individual pupil will be organized in view of his mental type, his ability, health, and all other factors which enter into his personal situation, to the end that the school shall serve him while he remains a member of it in the way which for him is the best possible.

7. In sectioning classes as well as making out individual programs assignments are to be made on the basis of mental ability, and the organization and pre-

sentation of instruction in a particular class adjusted to the standard of intelligence in the class.

8. It is the duty of the school to provide opportunity to those pupils who are forced to take employment to continue their study in continuation classes to the end of the programs upon which they have entered.

9. In the senior high school guidance will be more concerned with the individual's career and his larger social relationships.

10. All activities of the school shall be directed to the cultivation of "social mindedness."

The objectives in secondary education—The Commission on Reorganization has formulated the aims of secondary education as follows: "The Commission has selected seven objectives which it holds should determine the organization, administration, and supervision of the school, the subjects to be taught, the methods of instruction and the extra-classroom activities. Their objectives are: (1) health, (2) command of fundamental processes, (3) worthy home membership, (4) vocation, (5) citizenship, (6) worthy use of leisure, (7) ethical character." This formula is adopted as stating the content of the school product which the high school will strive to secure.

II. Psychological Aspects

Becoming an individual—We have considered the functions of the high school thus far with reference to its historical and social aspects. There are also psychological aspects. During the secondary school period the pupil is passing through certain psychological

changes which largely determine methods of instruction. He is in a stage of transition from childhood to manhood. He is neither child nor adult and yet partly both. As a child he was under the control of objective authority; as a man he will be governed by his personal insight and judgment. In the high school he is in transition from one status to the other—from objective to subjective control, from government by authority to government by personal judgment, from dependence upon the opinions of others to thinking for himself. He is *becoming* an individual. As a child his behavior was directed by rules of conduct imposed upon him from without; as a fully developed adult he will determine his behavior in the particular situation by the application of principles which he has personally adopted for his guidance. During his high school course he is changing from one state in the direction of the other. He has passed beyond the stage of submission to authority but cannot walk alone. His heart cries out for the right of self-determination, but he has neither the ability nor the body of experience necessary for complete self-determination. He is in the process of *becoming an independent being.*

Becoming a rational being—In the second place his mind is shifting its dominant interest from particulars to generals, from individual facts to laws and principles. He is less and less concerned about men as individuals and more interested in them as types. It is a time for generalizations of experience, for the elaboration of principles governing action, for statements of rules governing processes, for definition of standards of judgment. In childhood the mental

processes are directed primarily toward the gathering of a treasury of fact. The adolescent mind is primarily directed toward the organization of this material into a system of general ideas, and laws and principles which may serve as the premises of rational thought. That is, the youth is in the process of *becoming a rational being.*

Becoming socialized—Third, the social impulses grow stronger. Paradoxically, while becoming individualized he at the same time is becoming socialized. He is more and more individualized in his thinking, but more and more disposed to group action. If he seems diffident it is because his yearning for group relations has not been satisfied. It is in this period that he is most disposed to unite with the church, to join a fraternity, to align himself with a political party, to become definitely identified with a social set. He is in the process of *becoming a socialized being.*

Becoming a person—Youth is the time of the dawning of personality—the age in which the boy and girl adopt those aims, standards and principles of life that will constitute the warp of the fabric which their remaining years are spent in weaving. The time of seeing visions and dreaming dreams, of program making, of establishing relationships, of adopting the scale of values by which the youth is guided in his choices and by which his deeds are measured, of fitting his spiritual eyes with the lenses which shall determine his future perspectives—it is a pivotal period in the life of the boy and since it is pivotal, exceedingly significant and difficult.

The function of guidance—These psychological ten-

dencies of youth lay upon the high school as its primary function the guidance of the pupil in his transition from childhood toward independent personality. The school must make sure that he grows into true and wholesome insights, that he arrives at valid principles, that he comes into healthy adjustments, that he adopts a true scale of values. In large measure this guidance should be given in personal conference by a specialist and through the management of student activities, which properly take a prominent place in the school program. But even in as large measure, possibly larger, it must come indirectly through a wise encouragement of wholesome mental attitudes in classroom instruction. After all, the highest use of studies is to furnish the nutriment which is transmuted into personality, and the first demand of method is that it shall promote a proper growth of the pupil in his approach to maturity. It must be adjusted to the mental age of the pupil, and conform to the deeper psychological movements within him. This requires that the teacher shall recognize that he is dealing with neither child nor man, but with the child becoming a man. She must carefully avoid "over-shooting" the younger classes and "under-shooting" the upper grades. That government of the high school will be most efficient which allows considerable personal freedom under a patient but firm restraint. The ideal school would seem to be a "limited democracy," a flexible organization permitting and encouraging pupil initiative and group control under the guidance of a well-gloved, vigorous authority. If the school is large enough to measure out freedom from restraint of

authority in proportion to the maturity of the pupils, so much the better.

Value of group activity—There is great value in properly directed organizations because of their exercise of group action. The high school boy learns no more valuable lesson for life than to do his bit in play in perfect co-ordination with his team-mates. The self-restraint which he gladly imposes, the whipping himself to the utmost exertion for the honor of the school, his hearty co-operation with his fellows, playing the game fair and hard, are the roots from which grow the elements of splendid citizenship. The debating society, the dramatic club, the band, the orchestra, the school paper and similar organizations, offer invaluable training of the youth in social adjustments. Properly they should be recognized as means of development of personality rather than as modes of recreation.

Group activity in the classroom—The growing sociality of the pupil requires that group activity shall be introduced into the class work as fully as possible. The most effective stimulations of mental activity always are those arising out of social situations. With the child these situations involve mostly the relations of pupil and teacher, but with the youth and adult they comprise the relations of the individual and his group. The vigorous stimulations of class debate, of committee action, of a class program in which the teacher is referee rather than dictator, are pertinent illustrations. In the presentation of history and literature, particularly, the ethical implications properly should be stressed, taking care not to impose upon the pupil

the notion of teacher or text so much as to awaken in him a line of thought which will lead to a personal conviction. It is not extravagant to say that no lesson whose content bears upon human life should stop short of a personal conviction on the part of the learner. Knowledge is for behavior. The adolescent is trying to find himself in the institutional relationships in which he must live. Each lesson should contribute somewhat to the solution of his problem.

Emphasis of generalization—The tendency to seek for the general principles involved rather than to rest with the mere acquisition of facts indicates another essential element in high school method, the emphasis of generalization, the pushing of the examination of facts through to an insight into the principles involved in these individual cases. The temper of the high school student makes it advisable that he approach any subject with the attitude of the investigator rather than as a mere learner of other men's ideas. In order to acquire habits of systematic thinking he should be set to work on real problems in which he must analyze the situation for himself, find the necessary data, sift the evidence, and arrive at his own conclusions. Such activity his nature craves.

The psychological function of the high school requires *first,* that the government of the pupils shall provide for as large a measure of personal freedom and individual initiative as possible within the limits of orderly procedure; *second,* that the work of the school be organized in the form of group activity; *third,* that student conduct be secured by appeal to principle rather than by demanding obedience to con-

stituted authority; *fourth,* that the stress of instruction be placed on generalization from the mass of facts presented; *fifth,* that instruction and school life be directed toward the development of personality, that is, toward a proper scale of values and wholesome ambitions as well as a wholesome emotional experience.

III. Pedagogical Aspects

Knowledge of educational values necessary—Pedagogically, it is the business of the high school to help the pupil to realize the educational values resident in the several studies which by common consent constitute the secondary school curriculum. A proper understanding of these values is so essential to the determination of methods of teaching that a detailed analysis is necessary. The intelligent workman wants to know first of all *what* he can accomplish with his tools in order to know *how* to use them. Studies are not ends in themselves but tools with which to accomplish certain results in and with the pupils. Clearly no teacher is in position to plan her instruction until she possesses an adequate conception of the results she should obtain by means of such instruction. Much of our school work gets nowhere because it has no definite objective. Likewise much of educational criticism is futile for want of a definite standard for comparison. For these reasons considerable space is given in the following chapters to the consideration of educational values, first in general; second as involved in the several high school studies.

IV. Summary

The study of the principles of administration of secondary schools and of secondary instruction, involves the consideration of four factors in the high school situation: (1) the objectives in secondary education, (2) educational values of the subject matter utilized, (3) the mental process employed in the use of such material, and (4) the organization and methods necessary to the achievement of the objectives of the high school.

Historically the public high school grew out of the college preparatory school and the seminary, or academy, inheriting their major functions: preparation of the few for admission to college or professional school, and the training of the many for practical life.

The modern secondary school is under equal social obligation with reference to both of these functions. Democracy can not exist without a trained leadership supported by an intelligent populace. The high school should serve, therefore, to direct all pupils giving evidence of capacity for scholarship and professional usefulness to the college, providing them with the specialized training which affords the most advantageous introduction to the college cycle of education. At the same time the pupils who are to go immediately into their vocations should receive the instruction and training that will make them socially most useful in the walks of life they elect.

The large increase of attendance in our high schools, together with the consequent introduction of an in-

creasing proportion of pupils of the non-academic type, and certain social changes that place new responsibilities on the high school, have made necessary the entire reorganization of secondary education. This enormous task has been under way for many years, and is yet far from complete.

The principal features of the accepted plan for reorganization are: (1) The conception of the work of the seventh, eighth and ninth years as constituting a distinct educational cycle which should be assigned to the junior high school to be administered as a unit of the system, and of the work of the remaining three years of the secondary period as constituting another and inherently different type of work; (2) The functions of the junior high school are to make the transition between the elementary grades and the senior high school by completing the former and introducing the latter, at the same time giving to those pupils who leave school during this period that instruction and training which will be socially most useful; (3) The senior high school is to provide a program organized as a unified curriculum in which a small number of constants are prescribed, other subjects being optional with a loose grouping corresponding to the three mental types, the intellectual, the artistic, the practical; (4) Academic courses are definitely specialized, the practical arts definitely vocational, and the fine arts presented for appreciation of values as well as for skill; (5) The school will serve the individual pupil while he remains a member of it in the way which for him, all things considered, is the best possible.

The objectives in secondary education as stated by

the Commission on Reorganization are: (1) health, (2) command of fundamental processes, (3) worthy home membership, (4) vocation, (5) citizenship, (6) worthy use of leisure, (7) ethical character.

The period of secondary education is a time of transition in the life of the pupil, in which he is passing from a state of dependence upon others for control to a state of self-determination, in which his mind tends toward generalizations, in which he is becoming socialized, and a time of the dawning of personality. Guidance must take cognizance of this state of transition.

Group activity is particularly valuable in these early adolescent years, not only as the means to the fullest activity of the pupil, but also as preventive of the morbidness with which youth is sometimes afflicted. Group activity should be introduced into the classroom as largely as possible.

No lesson whose content bears upon human life should stop short of a conviction on the part of the learner.

The temper of the high school student makes it advisable that he approach any subject with the attitude of the investigator rather than as a mere learner of other men's ideas.

References

ARCHER, RICHARD L. "Secondary Education in the Nineteenth Century," The Macmillan Co., New York.

BRIGGS, N. ANAS H. "Secondary Education," U. S. Bureau of Education Bulletin, 1918, No. 47.

BROOKS, EUGENE C. "Education for Democracy, Rand, McNally & Co., Chicago.

BROWN, ELMER E. "The Making of Our Middle Schools," Longmans, Green & Co., New York.

BUNKER, FRANK F. "Reorganization of the Public School System," U. S. Bureau of Education Bulletin, 1916, No. 8.

CLARK, THOMAS A. "The High School Boy and His Problems," The Macmillan Co., New York.

Committee on Reorganization, "Principles of Secondary Education," U. S. Bureau of Education Bulletin.

COPE, HENRY F. "Education for Democracy," The Macmillan Co., New York.

DEWEY, JOHN. "Democracy and Education," The Macmillan Co., New York.

HANUS, PAUL H. "A Modern School," The Macmillan Co., New York.

JOHNSTON, CHARLES H. "The Modern High School," Charles Scribner's Sons, New York.

JUDD, CHARLES H. "Evolution of a Democratic School System, Houghton Mifflin Co., Boston.

LEWIS, WILLIAM D. "Democracy's High School," Houghton Mifflin Co., Boston.

LULL, HERBERT G., and WILSON, HARRY B. "Redirection of High School Instruction," J. B. Lippincott Co., Philadelphia.

MONROE, PAUL. "Principles of Secondary Education," The Macmillan Co., New York.

MUNROE, JAMES P. "The Human Factor in Education," The Macmillan Co., New York.

OBRIEN, FRANCES P. "High School Failures," Teachers College, Columbia University, New York.

PRINGLE, RALPH L. "Adolescence and High-School Problems," D. C. Heath & Co., New York.

ROBBINS, CHARLES L. "The School as a Social Institution," Allyn & Bacon, Boston.

RUSSELL, WILLIAM F. "Economy in Secondary Education," Houghton Mifflin Co., Boston.

SNEDDEN, DAVID S. "Problems of Secondary Education," Houghton Mifflin Co., Boston.

STOUT, JOHN E. "The High School," D. C. Heath & Co., New York.

CHAPTER II

EDUCATIONAL VALUES

I. A General Consideration

Traditional views—By the educational value of a study we mean the contributions which that study may make to the life of the learner. Thus it may give him a skill which he will employ in gaining a living; a body of knowledge necessary as a prerequisite to the successful pursuit of a higher branch of learning; an emotional experience which will enrich his life; a social insight which may modify his subsequent attitude toward society; a method of thought; a valuable life habit; or it may open up to him a conception which will revolutionize his personality. The traditional view conceives of studies as offering two contributions, knowledge and skill. The teacher commonly supposes the former to be the main if not the sole value of the study. It may be, too, in these days of over-emphasis of the so-called utilitarian subjects that greater stress should be placed upon the fact that all knowledge is valuable. The dictum of Herbert Spencer in his "Essays on Education" has led many far afield with the theory that some branches of knowledge are more useful than others. The difficulty in estimating the relative importance of studies lies in the tendency to

take a view of human life at once too narrow and too short. The thought of our day is afflicted with an educational myopia. The leaders as well as the public are too blinded by the immediate application of studies to appreciate properly those ultimate uses which over a long period may prove of infinitely greater significance. To prepare a boy for the demands of twenty-one is a simpler task than to fit him for the whole of his life. And to reach through him to his grandchildren, to build a nation, may give far greater significance to some facts than the prevailing feverish view reveals. Besides, the ultimate end of man is so uncertain that our problem is complicated by the necessity of going back to the creeds of religion for a starting point.

Danger of faulty perspective—Our judgment of the relative importance of studies is also impaired by our prevailing faulty perspective. One set of philosophers build their educational theory on the assumption that man is essentially and predominantly an economic being. Another sets out with the assumption that he is chiefly a biological creature. Still another conceives of him as primarily a religious, or an æsthetic, or a political, or a philosophizing person. Like the blind men who went to see the elephant, they get a grossly false perspective from the one-sidedness of their contact. It frequently occurs that the leader is swept from his feet by the zeal of propaganda and takes even less than a onesided view, as illustrated in the conception of some leaders in vocational education that economic betterment is wholly a question of improved production, forgetting that distribution and

consumption are equally important if not more significant factors in the economic situation.

Man a creature of many wants—Man is a seven-phase creature. He has seven sides to his nature which must be fed. He has a biological nature, but also a spiritual and ethical nature. He is a political being, an intellectual being, a social being, a property-getting being, and a pleasure-seeking person. He is all of these at once. He touches life at all angles all of the time. Every kind of knowledge is necessary to him. It is contestable whether, in the long run, one kind is more essential for him than another. His life depends upon the adjustments he is able to make in these several directions. For proper adjustments he is dependent upon the fullest and most accurate scholarship.

All knowledge useful—The only possible generalization from human experience is that each element of knowledge is useful at some time, and in some connection. In the exigencies of life every species of knowledge at some time becomes of vital consequence. Every fact is useful; to know it is a necessity in the complete life of man. It is impious to suppose that God created a useless fact, and that there is any body of truth, large or small, which is not humanly necessary. There is need of restoration of public regard for the truth—truth for its own sake, truth as a savings-account against the day of necessity. Society can not afford to have any body of knowledge, whether immediately applicable or not, lost in the stream of culture. Therefore, what may be called the knowledge value of studies is universal and paramount. On the whole and in the long run everything is worth teaching.

The evidence of history—"The history of the amelioration of human life gives conclusive proof of the principle that pure scholarship as distinguished from applied science is the source of progress; and democracy without progress is unthinkable. The developments in medicine, in surgery, in sanitation, in social organization, in machinery, have been secured as by-products of the labor of our scholars. The scientist patiently searching out the undiscovered is the pioneer blazing the trails of the new country in which every man may more nearly rise to his full estate. In the second place, the assumption that some knowledge is useful while some is not, is false. There is no useless knowledge. God never made a useless fact. Much is not immediately applicable, so far as we can see, but sometime, somewhere, the least significant of God's facts will prove indispensable to human welfare. The world is made so. Throughout history the penny-wise have been pound-foolish in their condemnation of what they called useless learning, only to discover later that these same things were the most useful. The irregular stone cast into the rubbish of the temple proves to be the keystone of the arch which must support the weight of the structure. Repeatedly workmen in their haste have thrown Greek roots, Latin verbs and the Aristotelian logic into the rubbish heap, but always in the end they have had to dig them out to complete the structure. In the economy of God's world everything has its place. There are no useless things. In the completed structure each fact is indispensable. This does not argue the unwisdom of utilitarian training emphasized in the schools to-day, but the fallacy of

depreciating the disinterested scholarship of the classicist and scientist, which suspends the weight of the utilities. It argues the indispensable value to a free and progressive people of just those things in higher education which they are prone to condemn as useless."[1]

Values classified—The first right of the pupil is that he receive from the study a compact, thoroughly digested, and organized body of knowledge. But further analysis discloses other values to which the pupil has equal right. These may be grouped into three classes:

Instrumental Values.
Cultural Values.
Disciplinary Values.

II. Instrumental Values

Defined and classified—By Instrumental Values is meant those contributions of the subject that serve as the tools or instruments which the individual employs in other activities. These values may arise either from the kind of knowledge conveyed or from the species of skill developed in the study which may be employed in successfully performing the functions of life or in coping with personal or social problems. For convenience of analysis the Instrumental Values may be considered as of six kinds: Preparatory and Introductory, Vocational, Ethical, Socializing, Conventional, and Health.

Preparatory and Introductory Values—A study has

[1] Commencement Address, Hanover College, 1920.

preparatory value when it is prerequisite to another study. Arithmetic is preparatory to algebra; reading is preparatory to all studies. Among high school studies this relation is not so marked, but algebra and geometry are necessary to the successful study of physics; physics and chemistry are necessary to the intelligent study of biology; history and literature are mutually dependent. A subject has introductory value if it presents the elements of another subject which extends this content and develops it in greater detail. General history thus introduces the more specialized history of periods and nations. Physical Geography prepares the way for geology by presenting the same field of knowledge in an elementary way. Latin is introductory to English grammar and vocabulary study, and to the Romance languages. Preparatory and Introductory Values depend on the logical relations of studies; upon the transfer of identical elements of knowledge or processes.

Vocational Values—The Vocational Value of a study is determined by its contribution to the equipment of the learner for earning his living, or for coping with the practical concerns of his life. Agriculture for the farm boy; home economics for the girl; physics for the individual who uses gas motors, electrical devices, machines, and mechanical devices of all kinds, and for the photographer, plumber, etc.; biology for all persons, likewise English; these are illustrations. Every subject has some degree of immediate utility, and to this extent is a vocational study.

Ethical Values—Character is the product of the blending of intellectual, emotional, and volitional ele-

ments. These comprise a set of standards of judgment, or principles of conduct, which are derived in part from a fundamental bias of mind, and in part from the generalizations of experience, either personal or appropriated from others through reading or social intercourse; a complex of feeling-tones which remain as a sort of residuum of the emotional experiences of the individual; and of habits and attitudes resulting from continued lines of conduct. Those studies which contribute to the first factor, standards of moral judgment, are credited with Ethical Value. History and literature are rich in such material. Elementary sociology, industrial history, the classics, and biology also offer abundant contributions of this character.

Socializing Values—The Socializing Value of a subject is its service in giving those social insights and mental attitudes which fit the individual for useful citizenship. An understanding of the dependence of all kinds of people on the worker, of the conditions under which he toils, of his hopes and his failures, his problems; an insight into what each class of people gives to the other classes, and in return what each receives from the others,—these will give a basis for intelligent judgment, and certainly arouse a sympathy which begets toleration, and these two together prepare the way for co-operation. The study of what our civilization costs in terms of toil, trouble and sacrifice opens the way to the conception and feeling of personal obligation which, joined with the Christian feeling of love, develops the attitude of service. Those studies which perform this function are socializing in their influence. History offers splendid material for this purpose.

Some of the newer courses in civics, particularly those which lay stress on the factors and problems of community life, are rich in this respect. Geography presents many studies of great possibilities for this kind of training. Descriptive sociology, with some emphasis on the significance of the several social institutions, has the largest Socializing Value.

Conventional Values—The preceding values are intrinsic, growing out of the content of studies. In addition to these is another depending on popular attitude or on what may be called standards of culture. We are familiar with the conventionalities of dress and social intercourse. There is a variety of free masonry which regulates the admission of the individual to the group by requiring his conformity to certain standards of knowledge and behavior without regard primarily to the inherent value of these things. Social recognition, opportunity for employment, political preferment, and the like, are far more determined by these conventions than a democratic person professes to like. Here and there an individual may beat down the walls of conventionality and force his way to success, but the majority are not able to break with these requirements of respectability however arbitrary they may seem to be. The wise teacher recognizes this fact and contributes what he can to the preparation of the novitiate by investing him with the necessary grips, signs, and passwords. Purity of English is a great asset wholly aside from its value as an element in sound thinking and general efficiency. It is accepted as the index of personal worth without regard to the real ability lying back of it. Good conversa-

tional power, aptness in story-telling, facility in public speech, and—even in these days of democracy—classical scholarship, have a high degree of Conventional Value. Many studies which have lost favor for pedagogical reasons in recent years, retain their right to a place in the curriculum because society requires them for recognition.

Health Values—Added to the foregoing Instrumental Values is the contribution which many studies make in the form of knowledge and practice necessary to the preservation of personal and public health. The principles of ventilation, house-heating, lighting and plumbing taught in physics are an example. Biology contains much necessary material; likewise physiology, dietetics, and psychology.

III. Cultural Values

Defined and classified—Many studies contribute richly to the development of those aspects of life which we comprise under the term personality. Moods, temperaments, attitudes toward life, force of character, go far to make up the desired educational product. They constitute the emotional factor which may with propriety be called the "heart of the man." The contributions of studies in this direction have what we call *Cultural Values*. There are three varieties of this contribution: Sentimental Values, Liberalizing Values, and Reconstructive Value.

Sentimental Values—These are realized in the form of that enrichment of soul and spiritual recreation arising as the by-product of emotional experiences.

Goethe says that we are shaped and fashioned by our loves, by what we admire and enjoy. The things a boy dreams over arouse pervading emotions that exert a far-reaching influence over his development. Hawthorne has embodied this principle in splendid fashion in his story of "The Great Stone Face." Lowell likewise develops the effect of the emotional reaction of passionate pursuit in "The Vision of the Holy Grail." Dr. Holmes illustrates the principle effectively in the analogy of the meerschaum pipe. Just as the meerschaum comes from the hand of the workman a characterless thing, but little by little is impregnated with essences of tobacco burned in it, becoming so saturated with the residuum that it comes to have definite color, taste and odor, so the boy's soul becomes saturated with the essence of the emotional reactions of studies, associations, and activities. A little of all that he thinks, feels, and does remains as a residual deposit in him, as a part of him, adding to and modifying his spiritual nature. The music he enjoys, the fun he has, his patriotic impulses, the quality of his play, the tone of his conversation, the imagery aroused by his reading, his enthusiasms, his loves and his hates, the things he admires or rejects, are highly potential because they remain as abiding elements in the emotional factor of his personality. Some studies are rich in the stimulations of feeling which they afford. They are said to have Sentimental Values. This is secured through the degree and varieties of appreciation developed in the study. Appreciation is of three varieties: Intellectual, Æsthetic, and Ethical. The first consists of admiration of successful performance of difficult mental

processes, of excellence of statement, and love of truth. It is secured by directing the attention of the pupil to the excellence of intellectual victories and stimulating in him an effort for the same sort of distinction in some field within the range of his ability. Æsthetic appreciation is love of the beautiful and is developed through long and intimate personal contact with nature and the various forms of art. Closely connected with æsthetic appreciation is the sense of humor and the enjoyment of play. The quality of humor is a significant factor in personality, and the kind of sport which appeals to the individual is an index to his culture. Ethical appreciation is the individual's discrimination of the relative worth of men and measures and admiration for those which are inherently best. A distinguished philosopher has said that the ultimate function of the college is to train and equip the student to be a judge of men. To foster admiration of the right sort of men and women certainly is no small contribution to the making of personality.

Liberalizing Values—Human freedom is a world-old theme of philosophers and poets. The former have endeavored to define it; the latter have sung its glories; warriors have fought for it as the most priceless heritage of man. We may distinguish two elements of freedom as educationally considered: first, that facility and accuracy of behavior which is made possible through increase of skill and scholarship; second, that positiveness and facility of action which come of the consciousness of equality. Increase of knowledge of the social and physical environment pushes

back the walls which circumscribe the sphere of action and relationship. The farmer whose knowledge is limited to the geographic and economic conditions of his immediate locality is limited in his plans to such conditions. He plans his crop program in the light of those conditions only. But the man whose extensive knowledge of geography, industry, and political conditions puts him into personal contact with the whole world is set free—he may plan his crop program with reference to all the factors of the world situation, not only for the particular season but possibly for a term of years. The merchant of narrow scholarship is limited in the scope of his operations to the range of his knowledge. He can adjust himself time-wise and space-wise only to the narrow sphere with which he is acquainted. But his competitor possessing a broad and intimate acquaintance with the natural and trade resources, and the economic, political and social conditions of all the world, is able to work out a business policy in intelligent adjustment with all of those conditions, not only for this year but over a considerable period of time. The former is working in the dark; the latter works with full knowledge of all the factors in the trade situation—the former is fettered by his ignorance; the latter is set free by his knowledge. Likewise, increase of skill of any kind enlarges the scope of activity. The man who has learned to do something better than anyone else rises above competition. The best surgeon is master of his situation, because he can choose the terms and conditions of his work as well as command employment. The man

equipped to seize the opportunity as it is presented is free compared to his unequipped brother. This variety of freedom means the ability of the individual to determine for himself the relationship into which he enters, that ability which makes possible a large measure of self-determination. Studies differ in the extent of their contributions to this sort of freedom. Many of them are rich in this service to the student. The sciences, history, geography, and the social sciences, obviously have this value in a high degree.

The second element in freedom is the self-command, force, poise and certainty arising from the consciousness of equality with one's associations and competitors, and from the consciousness of preparation for the situation. The sense of inferiority inhibits the flow of energy; impairs the functioning of mind and body; reduces power. A sense of equality or of superiority releases all available power; sets free the latent energy. All kinds of scholarship and skill have this sort of value, particularly those which enlarge and perfect channels of communication, and which relate to human affairs. Whatever imparts to the student the knowledge and art possessed by the ablest men with whom he comes into contact will make him "at home" in the world of men and enable him to appear and work at his best.

Reconstructive Values—A man's life at any time is fairly well unified and its direction determined by what is called his point of view, his outlook upon the world, his philosophy of life. This organizing idea colors his interpretation of experiences, his judgment, and his

choices. It determines his scale of values and the objectives toward which he strives. Within this larger unifying conception he has others relating particularly to his several institutional relationships. One idea governs his political thinking and conduct; another his religious character; another dominates his moral life; another his industrial relations, etc. These several organizing principles form the warp of his life fabric. At any particular time they are incomplete, but partial apprehensions of the truth, and possibly in part or wholly erroneous. They are modified by new experience, sometimes completely revolutionized as in religious conversion. A reconstruction of so much of one's life as was governed by the old idea follows. The reorganization of thought and the life program produced by religious conversion is typical of the reconstruction which may follow from the apprehension of a new scientific principle, the reading of a book, the study of philosophy, or anthropology, or economics, or the personal contacts of school life. The contributions of this kind which studies make to the pupil constitute their Reconstructive Value. All subjects make some such contribution and history, literature, science and vocational subjects are particularly rich in reorganizing possibilities.

IV. Disciplinary Values

Defined and classified—By Disciplinary Values is meant the reactions of studies on the mental processes, attitudes and habits of pupils. It is generally con-

ceded that in addition to the concepts in the various studies, which may be used in the pursuit of other studies, and which may also be employed in the solution of the practical problems of life, there are certain disciplines realized that are of general application. These take the form of: Increase of Intellectual Power, Development of Mental Attitudes, and Formation of Valuable Habits.

Increase of intellectual power—It is reasonable to expect that the brain will respond to the same laws of growth which govern other bodily organs and that a vigorous course of study will entail such cerebral activity as will result in a maximum of cerebral development. To what extent this may occur is not determined, but evidently in sufficiently large degree to warrant the popular belief that vigorous intellectual application is accompanied by "increase of brains." Whatever may be the fact as to such physiological development, it is obvious that systematic study does establish definite mental processes and methods of attack. The logical handling of mathematical subjects tends to fix more definitely the analytic-synthetic movement as a method of attacking all problems. In the study of a foreign language the pupil becomes experienced in processes of substitution and organization that are identical with processes in industry, trade and the professions. The practice in contingent thinking in the study of history develops a type of judgment which the individual will employ in his approach to subsequent social problems.

Habits of thought movement are as readily developed as are habits in other types of behavior. Thus

the pupil may be equipped with a set of methods which he may employ advantageously not only in subsequent studies but in practical life as well. This is well illustrated in the practical utility of the methods of laboratory experimentation, methods of research, and of the carrying over of the discipline of the shop into practical judgment of the quality of the manufactured product.

There is also possibly an increase of the intelligence level of the individual through the wealth of the stimulation which some studies afford. It is not fully determined that mental calibre is entirely fixed and that the individual at a given age possesses a certain degree of intelligence regardless of his experience. It is suggested with some plausibility that a large element of mental deficiency is due to the absence of proper stimulation at the proper time. This suggests that a rich stimulation as mental functions ripen may result in a real increase of mental capacity. Certainly it would at least result in the fullest realization of potential limits.

Development of mental attitudes—Such characteristics as responsiveness to suggestion, open-mindedness, disinterestedness in research, judiciousness in weighing evidence, fairness, poise, and desire for truth, all of which are requisite in the well-trained thinker, obviously are largely a by-product of studies. Many subjects are rich in possibilities of this kind. The laboratory studies are especially so. History offers a splendid opportunity for the development of open-mindedness; literature should make any pupil judicious; all descriptive studies cultivate the love of

truth and reduce the personal equation. The careful teaching of any study should create the disposition to demand adequate proof.

Formation of valuable habits—Properly directed study of any subject also develops such valuable life habits as industry, perseverance, painstaking neatness, veracity and honesty. While, strictly speaking, these habits are specialized, yet the ideals involved are so strong as to form definite tendencies which carry over into all activities. Experience goes to establish the fact that the habits of the school room quite generally cling to the individual for life. Certainly this contribution of studies, or of the manner of handling them, and especially of the quality of application exacted of the student, is a most significant service of the school.

V. Exercises

1. Score the Educational Values potential in the several studies of the conventional high school curriculum when well taught, using the following form. The several values may be indicated by inserting in the appropriate squares, the words *High, Medium, Low,* and *No* as exponents of the values which the study is adjudged to possess. It is assumed in such exercises that the subject is taught efficiently. As a matter of fact the value of the subject is in most cases conditioned by the quality of teaching. The question to be considered in the exercise is the values which may be realized by proper handling of the study.

SCORE CARD FOR MARKING EDUCATIONAL VALUES OF HIGH SCHOOL SUBJECTS

Subject	Instrumental Values						Cultural			Disciplinary		
	Preparatory and Introductory	Vocational	Ethical	Socializing	Conventional	Health	Sentimental	Liberalizing	Reconstructive	Intellectual Power	Mental Attitudes	Formation of valuable Life Habits
Algebra												
Geometry												
English												
History												
Civics												
Physics												
Chemistry												
Biology												
Latin												
French												
Agriculture												
Home Economics												

A college class has formulated its conclusion as to the several educational values of the more prominent high school studies in the following table:

(Exponents = 0, 1, 2 and 3, in order.)

	Instrumental Values						Cultural			Disciplinary		
	Preparatory and Introductory	Vocational	Ethical	Socializing	Conventional	Health	Sentimental	Liberalizing	Reconstructive	Intellectual Power	Mental Attitudes	Formation of valuable Life Habits
Algebra	3	0	0	0	0	0	1	2	0	3	3	3
Geometry	2	1	0	0	0	0	1	2	0	3	3	3
English	3	3	3	2	3	0	3	2	3	1	2	1
History	1	1	3	3	3	0	3	3	3	1	2	1
Civics	1	3	3	3	2	0	0	2	2	1	2	1
Physics	1* to 3	3	0	0	0	2	0	2	0	3	3	3
Chemistry	1* to 3	3	0	0	0	2	0	2	0	2	3	3
Biology	3	3	0	2	0	3	3	3	2	1	2	3
Latin	3	1* to 3	0	0	2	0	0	0	0	3	3	3
French	1	2	1	0	2	0	0	2	0	2	1	1
Agriculture	0	3	0	0	0	0	0	2	0	1	1	2
Home Economics	0	3	2	0	0	3	0	2	1	1	1	2

(*) Depending upon subsequent education of pupil.)

VI. Summary

In the consideration of educational values it is important to avoid a narrow view of life. Man has seven sides to his nature which must be fed. He touches life at all angles all the time: every kind of knowledge is valuable.

There is need of restoration of public regard for the truth—truth for its own sake, truth as a savings-account against the day of necessity.

The first right of the pupil is that he receive from the study a compact, thoroughly digested, and organized body of knowledge.

Besides the Instrumental Values of studies, generally recognized, there are certain Cultural and Disciplinary Values which may be secured by the proper use of subject matter. There is obvious need of greater emphasis of these latter values.

Instrumental Values comprise (1) Preparatory, (2) Vocational, (3) Moral, (4) Socializing, (5) Conventional, and (6) Health values. The Cultural Values include the (1) development of sentiments, (2) liberalizing of mind, (3) reconstruction of point of view.

By Disciplinary Values is meant the reactions of studies on the mental processes, attitudes and habits of pupils. These values may properly be stated as habits of thought, of personal attitude, of action. While the evidence seems to indicate the impossibility of appreciably increasing the mental stature of the pupil, it is true that studies provide the stimulations necessary to realize the child's potentialities.

Granting that habits are "specific," the fact remains that the complex activities making up a busy life contain a limited number of types of activity. The individual who becomes habituated to a given type of activity requires small effort to connect such habit to the cue in the new activity. To the practical man there is no question that the school program may be made to prepare very directly for life.

The extent and character of the values which the pupil secures from a study depend very largely upon the character of the presentation of the subject, and in some studies almost entirely so. In some courses the value is inherent in the content; in others it is involved rather in the teaching processes employed. On the whole the worth of a study is determined by the character of the pupil's reaction thereto.

References

BAGLEY, WILLIAM C. "The Educative Process," The Macmillan Co., New York.

BAGLEY, WILLIAM C. "Educational Values," The Macmillan Co., New York.

BORASS, JULIUS. "Teaching to Think," The Macmillan Co., New York.

BUTLER, NICHOLAS M. "The Meaning of Education," Charles Scribner's Sons, New York.

DE GARMO, CHARLES. "Principles of Secondary Education," Vol. I., 1907 Edition, The Macmillan Co., New York.

DE GARMO, CHARLES. "Principles of Secondary Education," Vol. I., The Macmillan Co., New York.

HANUS, PAUL H. "Educational Aims and Educational Values," The Macmillan Co., New York.

HARRIS, WILLIAM T. "Psychologic Foundations of Education," D. Appleton & Co., New York.

HECK, WILLIAM H. "Mental Discipline and Educational Values," John Lane Co., New York.

HORNE, HERMAN H. "Philosophy of Education," The Macmillan Co., New York.

JOHNSTON, CHARLES H. "High School Education," Charles Scribner's Sons, New York.

O'SHEA, MICHAEL V. "Dynamic Factors in Education," The Macmillan Co., New York.

ROEMER, JOSEPH. "Function of Secondary Education," George Peabody College for Teachers, Nashville, Tenn.

SPENCER, HERBERT. "Education," H. M. Caldwell Co., Boston.

THWING, CHARLES F. "What Education Has Most Worth?" The Macmillan Co., New York.

VINCENT, GEORGE E. "Social Mind and Education," The Macmillan Co., New York.

CHAPTER III

TEACHING PROCESSES

The methods of high school instruction are determined, as stated before, in part by the functions of the high school, and in part by the educational values inherent in studies which the school seeks to realize by means of such studies. These methods are determined also by the mental processes involved in all subjects. They are:

I. The Learning Processes.
II. The Memory Processes.
III. Appreciation.

I. The Learning Processes

A new subject of study, topic of thought, or problem may be approached in either of two ways, depending upon the nature of the problem and the extent and character of the related information already possessed. These are the Inductive Approach and the Deductive Approach. Without going into the psychology of these processes of investigation, we may say that in general the former method of attack is used in the development of new ideas or principles, while the latter is used in the application of general principles to specific cases, and in criticism.

1. The Inductive Approach

The inductive approach takes four steps: Acquisition of facts; recall of related knowledge; analysis, comparison, synthesis; and generalization and naming.

Acquisition of facts—The data to be used in arriving at the solution of a problem are derived from three sources, and properly in the order indicated: (1) Authority, (2) Observation, (3) Experimentation. The class in biology would necessarily use the inductive approach in the investigation of the problem of "The relation of bird life to insect pests." The first step in the study would be the amassing of a great quantity of facts. The larger this acquisition, the more reliable the conclusions which may be drawn. If the science teacher is intent upon training his pupils for scientific procedure as well as on giving them his opinion on the subject, he will endeavor to have his class gather information of the largest number of cases feasible under the situation. He will have his pupils first of all exhaust the content of available literature on the subject. They will familiarize themselves with the history of former investigations. They will accumulate notes of specific cases, such as the disappearance of certain insects in the locality at the time when a certain species of birds become numerous; the increase of insects in those districts where bird life has become rare; the increase of scale on fruit trees with the increase of the sparrow; the number and variety of insects found in a robin's crop. If this source of information is exhausted, the class will have

a large fund of concrete material from which to generalize. Besides, the generalization will have more meaning because of the factual background. This mastery of available material prepares for the next step to be taken in two ways: first, by stimulating personal observation on the part of the pupil, and secondly, by directing such observation more definitely into profitable channels. He will understand what to look for and the best way in which to proceed. He will also, possibly, discover some aspects of the subject for which necessary data have not been found. Thus he secures a new motive, the desire to make a personal contribution and the realization that the thing needed is within the range of his ability. The class may be directed to make extensive observations of the food supply of the different species of birds living in the vicinity during the season when insects are available; they should follow particular birds. They should find out all they can on the subject first hand. This source of information, of course, is inexhaustible; but as he proceeds with the investigation, the pupil may discover some aspects of the problem which are not cleared up by the results of his reading and observation. He then takes the next step, namely, he works out an experiment in which he may definitely control all of the factors in the situation. He may confine the robin and supply it with as many different varieties of insects as he can procure and observe whether it eats them, and any preference exhibited. The purpose of experimentation is to test out reported observations and to supplement the results.

Recall of related knowledge—With an adequate

accumulation of data the pupils are ready for the second step in the Inductive Approach, namely, recall of the discoveries made in similar investigations and of the theories which have been advanced in connection with the present problem of the relation of birds to insect pests. Possibly they will have done this while gathering the data.

Analysis, comparison, synthesis—With all of the material before them which they have gathered from their own observation, and from their experiments, together with the light which their general knowledge may throw on the question in the way of suggested solution or limitation, the pupils are now ready to analyze the several specific cases into their several aspects; select these aspects one by one as points for comparison of the several cases; and thus prepare the way for generalization. It is important that such analysis and synthesis be made systematically. Otherwise, the pupil's mind will rush into a conclusion which represents his general impression rather than a proper generalization of his experience. To illustrate, in his investigation he may have found that all of the birds observed eat young grasshoppers. This naturally suggests a conclusion. But an analysis of his notes on the robin may show that this bird eats young grasshoppers only when he can get nothing else. Taking this aspect of the robin's habits as a point of comparison, he examines his records in all the birds observed. Should he find that all are like the robin in this particular, he will have arrived at a legitimate conclusion. His knowledge is truly definite and trustworthy within the limitation of his study.

Generalization and naming—Abstracting one aspect after another from the mass and submitting all cases to comparison with reference to this aspect, he soon finds his knowledge organized and synthesized or compacted into a small number of propositions. This is the process of generalization. One thing however remains. The last step is to give the generalization a proper expression in language; that is, to formulate a statement which includes all of the facts which properly belong, showing them in their proper correlation, and noting all exceptions, extreme variations and exclusions. Definition or Naming is exceedingly vital both as completing the thought process and as making it available for subsequent use. Carelessness at this point will largely vitiate the whole process. We think in words, and, very generally, remember what we report as our generalization rather than the actual conclusion. Good teaching makes sure that the pupil concludes his research with a statement which tells the truth, the whole truth, and nothing but the truth.

2. A Modified Form of the Inductive Process

The Inductive Method, however, takes another form for the development of concepts of individual things or of classes of objects; for example, the Battle of the Marne, the Ohio River, the Maple Tree, Whittier's "Snow Bound." In studies like these the learning process will generally take the following form:

(a) The determination of those qualities or aspects of the individual or the group which are apprehended

through sense experience; namely, through vision, hearing, touch, taste, smell and resistance. This will include size, shape, direction, color, sound, odor, savor, texture, surface, strength, etc., as these may be involved in the thing studied.

(b) Examination of the relations of the thing or group studied to other individuals or groups with reference to the categories of: Time and Place, Whole and Part, Similarity and Contrast, and Cause and Effect.

(c) Consideration of the relations of the thing or group to the learner.

3. Illustrations of Inductive Approach

Lesson plan for study of the maple—In an exhaustive study of the maple tree, the class proceeds first to investigate those characteristics of maple trees which are apprehended through the senses. Thus they will consider the form and size of the maple, the proportion of trunk and top, height and circumference, color of bark and leaf, leaf shape, the angle of the limbs, movement if any; and such other facts as may be observed with the eye. This will be followed by the question as to whether a maple forest gives out a characteristic sound. Next the textile characteristics of leaf, bark, the polished and unpolished wood; the taste of leaf sap, of bark, of body sap; the odors given off; the brittleness, flexibility and tensile strength of the wood. In acquiring this information the three sources outlined in the preceding pages will be utilized—Authority, Observation, and Experiment. Having exhausted

these aspects of the subject, the class will then approach the relationships of the maple. These will include, under the first category, Time and Place, the period of growth, age limits, seasonal relations, durability of wood, habitat. Under the head of Similarity and Contrast will be considered the likenesses and differences of the maple and other kinds of trees, the varieties of maples with their distinguishing characteristics, and the variation of individual trees. Tree anatomy and botanical classification will come under the head of Whole and Part. The causal relations involve the facts as to reproduction, conditions of growth, ecology, and the uses made of the maple. The last division of the study, relations of the maple tree to the pupil, may not offer much of importance aside from sentimental values which will not have been considered under other heads. But these sentimental values may have great significance in the making of personality even if their scientific worth is small. It is very much worth while to speak of the maple in connection with pioneer life, of historic individual trees, and of any symbolism which has been attached to it by custom.

Plan for study of the Battle of the Marne—In the study of the Battle of the Marne the class will pass through the same particular processes, but not necessarily in the same order. Logically, time and place relations would be considered first; the time with reference to the climax of the war as well as by the calendar; the place relations including location, extent and topography. The class might properly follow the movements leading up to the battle and the objectives

whose realization turned upon the outcome of the contest; the relation of the battle to the campaign of which it was a part, and of the campaign to the war as a whole, and of the war to the historical and economic struggle of which it was a part; the parallelism of this battle and the climaxes of other great wars—Waterloo, Sedan, Gettysburg. The immediate and ultimate results of the victory of civilization at the Marne certainly must have great emphasis. All of these aspects of the battle offer topics for extended discussion. But if the pupils are to comprehend in the fullest measure the enormity of the struggle, the horrible depths to which human nature will descend under the lash of greed and lust, the fearful price which was paid that liberty might survive the titanic forces of body and spirit hurled at each other across those swift waters, they must also see the rushing hordes, hear the hellish roar, the curses of mad men, the shrieks of dying men; they must smell the reek of blood and the sulphurous smoke of man-made hell; they must sense the struggle of it, the destruction; they must live it through if our teaching is to help prevent The Marne's being fought again. The order of treatment may be transposed but the concrete and particular as well as the relational elements must be wrought into the concept if it is to have meaning for the pupil.

Plan for study of a literary selection—The study of a literary selection will involve the same processes with possible change of order. To read "Snow Bound" means to reproduce the emotional experience which Whittier has embodied in the imagery, the musical elements, and the symbolic memories of the poem.

Obviously the sense elements here are predominant. The meanings of words, tone, pitch, motifs, rhythm, are first to be apprehended. Then there are questions of time and place, but particularly of contrasts; contrasts of place, of characters, of night and day, of the blazing logs on the hearth and the bitter chill without, the pulsing humanness of the family circle and the cold inhumanity of the snow covered world the next day. By means of the music of his verse, the sequence of visual images, and the series of character and plot contrasts, the author carries the reader through varied emotions up to the conception which the poem embodies. The pupil comes to know the poem by following the same order of processes.

Further illustrations of the Inductive Approach will be given in the later discussions of special method of the several studies.

4. The Deductive Approach

The Deductive Approach is employed in many studies in the illustration of general principles or rules by application to particular cases. This process is familiar in algebra, physics, the identification of plants, and the rules of grammar in foreign language study. While new knowledge may be derived or assistance secured in the solution of a problem, the chief purpose is to strengthen the mental grasp of the generalization. That such exercise is necessary is patent, and that in the pressure of work this phase of teaching is likely to be underdone is obvious. Most teaching is vitiated

by too little illustrative application. But the deductive lesson may be employed effectively in the application of generalizations to new studies or fields of inquiry. Thus the generalizations of algebra and geometry may be turned back to illumine the difficulties of arithmetic, Latin made to clear up English constructions, history to give an illuminating setting for the better understanding of literature. The generalizations of one study may be employed to introduce the facts and principles of a correlative study. Again they may be applied to current problems of life. The history of colonial governments will assist the pupil in thinking out the principles of America's policy toward her dependencies. The principles of physics may be applied to the problems of community water supply, the heating, lighting and ventilation of buildings, the city light plant, municipal heat plant, etc. This phase of teaching must be emphasized if the school is to be truly dynamic, if it serves its function of preparing pupils for the business of intelligent living.

II. The Memory Processes

The efficient teacher not only seeks to impart knowledge and develop skill but to direct his teaching in such a way that the pupil retains the knowledge and skill under instant command. There may be some value occurring from studies whose content is forgotten but on the whole the pupil's memory of instruction is the measure of the success of his labors. The ex-

tent and quality of what the pupil retains from a lesson is the index of the efficiency of the teacher.

1. Waste Involved in Memory Losses

The enormous waste involved in memory losses gives a very practical reason for special attention to this aspect of the teaching process. It is reported that thirty per cent of the content of a lesson is lost within one hour unless the exercise is directed into channels to avoid such waste. Under the same conditions, there will be further loss of twenty per cent sustained within twenty-four hours, and an additional thirty per cent within one month. This would indicate a total loss under careless instruction of eighty per cent within a month. Granting that these statements are greatly exaggerated, the loss certainly is so serious as to command attention of the reader. There is the further reason for such concern in the fact that student ability is determined by the wealth of memory content. To think is to apply remembered concepts to the new situation. The individual with impaired memory is mentally feeble to the extent of such impairment. The pupil whose retention of presupposed information is uncertain is hopeless. These facts are commonplace to the teacher, and yet so intent is the average instructor upon the presentative phase of teaching that he is quite certain to overlook the necessity of making sure that the results of his labor are not speedily dissipated.

Two sets of memory principles need emphasis; those relating to Retention, and those relating to Recall.

2. Teaching for Retention

The conditions which insure permanent retention are: Native Retentiveness, Favorable Attitude, Strength of First Impression, and Repetition.

Relation of health to retentiveness—Retentiveness is to some degree native and hence beyond the control of the school. But this aspect of memory is a physiological function, depending upon the plasticity of the brain, and therefore subject to modification by the health of the pupil. Irregularities in the physiological regimen of high school youth, insufficient nutrition, loss of sleep, excesses of all kinds, interrupted physiological functions, poor school situation—whatever impoverishes the blood supply and is a drain upon vitality impairs retentiveness, and necessarily must be subject to school regulation for pedagogical as well as for hygienic reasons. Wholesome living is as necessary to efficient school work in the sense of providing a proper physiological machinery as in the sense of saving time and conserving attention. The school must, as a matter of self-defense as well as of duty, assume a larger share of responsibility for the physical welfare of its students.

Effect of mental attitude—Ordinarily the mind retains more successfully those experiences which have a pleasurable tone. This fact is the ground for the effort to maintain a state of good-feeling in the school, a contented spirit, and, in particular, a favorable attitude toward the studies. It is helpful to spend time in arousing a pleasant anticipation of the subject. The inspiring teacher gets the largest net results, not only because she commands a fuller attention of her

class and secures better application, but also because of the glow of feeling which she imparts. A state of enthusiasm "warms the wax of the mind" and makes it more impressionable.

Importance of vivid impression—Obviously the deeper the impression the more enduring it is. Clearness of definition, aptness of illustration, and vigor of statement secure fuller attention. Concentration of the mind of the class upon the matter in hand is necessary to permanence of impression. Whatever of the teacher's enthusiasm, of device, of concrete embodiment, of personal application serves to command all the attention for the time will deepen the impression. The classroom atmosphere should be charged with energy, the pupils keyed up to the verge of excitement. The good smith works his metal hot. He makes poor headway with cold iron. The teacher does no better with half-energized or indifferent pupils. His impressions are deepest when his classes are worked up to keen expectation. Intense application for a brief period yields much better results than the same amount of energy spread over a longer period. Senator Stanford, the dean of modern horse breeders, based his training method on the rule, "Compel the colt to go his best for his distance." His theory was that it is the animal's supreme effort, stopping short of the fatigue point, which brings growth. This principle applies equally well in teaching. The pupil's maximum effort for a proper period gets results. Less than his best effort is a waste of time.

Value of repetition—Repetition is the fourth condi-

tion of retention. The more frequent the repetition, provided no exceptions are permitted, the more definitely the corresponding brain path is organized. This is the well known law of habit formation, the basis of memory and of skill. Possibly no other principle of psychology is more generally ignored in the high school. Drill, Drill, Drill, is the price of precision and memory. Vividness of presentation of subject matter, enthusiasm, interest will reduce the amount of drill necessary, but can not wholly displace drill. There was a time when school work was too largely of this nature. The resultant reaction has gone quite to the other extreme. Courses of study have been elaborated and the content of studies enriched. Teaching is improved in many respects. But because of the lack of patient, painstaking, continued drill, the present day high school graduate knows a little about a great many things, but knows little with real certainty. No sensible person would advise a return to the methods and curricula of former days, yet all must recognize that the human mind is constructed on a definite plan to which all must conform. The necessity of constant drill on the things which we want permanently retained can not be escaped. A soldier is not made by a lecture on squad formation and a demonstration of the manual of arms. There is much in the high school subjects—more possibly than we realize—of mere formal work whose possession is acquired in precisely the same way that the recruit is made into a soldier, namely, by persistent repetition.

3. Teaching for Recall

There are two conditions of effective recall: Association of Ideas, and Organization of Ideas.

Association of ideas—The principle of association is fundamentally physiological; namely, ideas which are thought together tend to recall each other thereafter. Frequent repetition of a series will increase this tendency. If the ideas are logically related, the tendency is increased in much greater degree. The careful teacher seeks to connect the new ideas with the older ideas in the minds of the pupils, particularly with those which have promise of permanent retention and prompt recall. She secures this connection by causing the pupil to think the relations sustained by the objects of thought, such as their contiguity in time and place, their similarity and contrast, their causal relations and the like. Thus she causes the pupil to weave the series of ideas into a chain, each link of which is held within the links preceding and following. If one idea of such a series is brought into consciousness it will bring after it the entire series.

Organization of ideas—The organization of knowledge is a further application of the principle of association. It is the association of ideas around a central theme or in the form of a classification. Chapter and book summaries secure such organization of material. It is a good practice to close the lesson with a summary of the content of the discussion reduced to a few pointed statements. Each division of the subject should be similarly treated. Outlines prepared by

the pupils, showing the division and the subdivision of the subject, are fine exercises for the same purpose. Organizing reviews are also of great value. These various exercises weave the content of studies into a fabric which it is easy for the pupil to hold and to utilize when need arises. They also give perspective and that feeling of definiteness and certainty which the pupil craves. It would seem superfluous to warn the teacher against making outlines and summaries for her pupils, formerly a somewhat common crime of the school. The value is not in having the outline or summary, but in making it. Pupils should be encouraged to be original in such organization. Frequently several forms of summary are equally worthy. A premium should be put on individual generalization. And pupils should be encouraged also to organize their lessons in preparing for a recitation. This practice well established will secure permanent improvement of study.

III. Appreciation

Definition—Appreciation is a by-product rather than a process. It is tri-phasal. There is first the element of enjoyment. To appreciate signifies to enjoy, to like, to find pleasure in the activity or object. Second, there is the element of recognition of the intrinsic worth of the activity or object; the sense of a value residing within it wholly apart from its relations to the person or to other things. In this sense to appreciate means to value, or to judge that the thing is inherently valuable. In the third place, there is a

volitional element, somewhat in the background of consciousness, possibly, but certainly present in the form of an avowed attachment and devotion to the thing. Thus, appreciation of poetry involves enjoyment of verse, the conviction that it is a good thing in itself, and the attitude of patronizing poetry. To appreciate art means to find pleasure in it, to regard it as a good, and to encourage it in various ways as a visitor at exhibits, as a contributor, a supporter, a defender or advocate. On the intellectual side it may signify also a discriminating judgment of the relative merits of art productions.

Four types of situation which arouse appreciation—As indicated in the preceding chapter, there are four types of situations which arouse appreciation; the intellectual, the æsthetic, the humorous, and the moral. We thus may speak of four kinds or types of appreciation: Intellectual, Æsthetic, Humor, and Appreciation of Manhood, or Ethical Appreciation. The first is commonly known as the Scientific Spirit, the Scholarly Attitude, or Wit, depending upon the phase of mental activity which commands attention. The second is commonly known as Taste; the third as the Sense of Humor, and the last as the ability to judge the worth of men and women, and the tendency to react emotionally to personality.

Appreciation as a factor in education—Thoughtful educators are coming to see that the cultivation of appreciation in these four forms is possibly the greatest service which the school and college can render. Certainly, however valuable accurate scholarship is in itself, the scholarly attitude of mind, critical judgment,

the disposition to investigate, to find for one's self the facts involved, to check and prove, and to exult in the truth discovered—these habits and attitudes of mind are far more profitable personally and socially. The high school and college have no higher privilege than the nurture of the spirit of truth-seeking and truth-telling, the spirit of investigation, and admiration of intellectual performance. In art education the development of appreciation is the primary objective, and the necessary condition of technical skill. Taste is a large determining factor of life. As scholarship frees the soul from the prison walls of ignorance, so the ability to perceive and enjoy beauty frees the soul from the deadening grind of monotony and drudgery. Dwelling in a world of conscious beauty, a world of birds' songs, of color, of fragrance, of sparkling dew drops, a world speaking to the soul of the beauty of life, will lift that soul above the blighting hand of despair. An eminent specialist in the care of the insane was asked to advise a class of young teachers with regard to the best form of social service which they could render. His reply was: "Go out and open the eyes of the people to the beauty of sky and field, of music and verse, that their minds and souls may be kept sweet and sane." The same may be said in behalf of the cultivation of the sense of humor. Its practical value to the man and woman whose work requires them to get along with people can not be overemphasized. But as a condition or means of giving the individual a proper perspective of life, as a curative measure in crooked thinking and of wrong attitudes, it is of even greater value. Humor is the salt

with which human nature is kept fresh and wholesome. Moral appreciation or the ability to judge men, and the enjoyment of the best men, President Eliot has said, is the essence of a sound education. The man who possesses this species of ability and this emotional tendency is an educated man in the most vital sense. To be able to discern the true worth of an individual, to perceive his elements of strength and weakness, and to enjoy greatness of manhood wherever it may be discovered, is to command at the same time a valuable ability and the source of the rarest human satisfaction. Knowledge and skill are socially necessary. They are proper objectives of sound education. But the highest objective in point of social value and personal satisfaction is the developed and trained appreciation.

Appreciation and personality—Appreciation is a large factor in the composition of personality. In the first place it is highly recreative. This is particularly true of æsthetic appreciation. To the man who has learned to find joy in beauty, whether of music, art, literature, or nature, there is a perpetual fountain of youth from which he draws new energy and new hope for the tasks of to-morrow. In the second place it is formative. The boy absorbs into the texture of his soul the color and the tone of the emotional experiences awakened by the object of his admiration. This is especially so in the case of his attachment to his ideal man and woman, whether a real person or the hero of his day dreams. And again, one's type of appreciation determines for him his associations, and hence his field of imitation. "Tell me the kind of music your son enjoys and I will tell you where to find

him." Or tell us the kind of things your boy thinks fun and we will tell you the kind of man he is becoming.

Appreciation developed through reaction to form and content—The cultural values discussed in the preceding chapter depend almost wholly upon the type and degree of appreciation developed in the pupil. Hence the importance of understanding how it is developed. Properly speaking Appreciation is *induced:* first, through the reactions secured to elements of form; second, through the reactions to elements of content. That is, appreciation is the product of those emotional experiences which accompany the motor responses brought out through the stimulation of elements of form and content in art, humor, intellectual activity and persons. The character of the motor response determines the degree of appreciation, and the type of situation which brings out the motor response determines the type of appreciation.

Elements of form—The elements of form in these stimulating situations are three: Rhythm, Grammar, and Style. This terminology varies with the different fields of appreciation. Rhythm, including symmetry, balance, proportion, variety in unity, meter, motif, tone, color, arouses definite reactions, both motor and sensory. It is fundamental in human nature. The reactions are instinctive. If the response is wholly unrestrained the emotional experience will be correspondingly rich. The natural reaction to music is the dance, not the conventionalized parody of the sex-conscious functions, but the spontaneous response to metre, pitch, and motif. To poetry the natural reaction is a combination of pose, dance, and chant; to

art it is the pose; to architecture the following of the lines in balanced sequence. In language it is the vocalization of the words, and impersonation. The point of significance in the present connection is that it is in the richness of the motor reaction that the character of the emotional experience is grounded and the degree of appreciation awakened. The teacher of poetry who desires to arouse appreciation of the particular selection, or of all poetry, must cause her pupils to experience the cadence, the refrain, the accent, the mimicry of the words, the musical pitch, either by actual reproduction of these elements or by making the muscular adjustments involved in the reproductions. Language is a mode of behavior more or less conventionalized. The attitudes involved in the initial behavior embodied in words are an essential part of the poem and are to be reproduced if the full value of the selection is to be realized. It is the reproduction of the "behavior" within the rhythm of the poem, in the musical key in which it is written, and in proper time and force, that secures the feeling which gives the reader a full experience. Appreciation like every other mental function is subject to habit. Any type of literary or musical experience frequently repeated for a considerable period forms a habit, a strong tendency to respond pleasurably to that type of situation, and an equally strong corresponding tendency not to respond to other types of situation. The question is frequently raised as to why the American people do not appreciate poetry. A partial answer is found in the fact that in the first place it is very generally presented to the

pupil as a logical exercise with the purpose of giving him an intellectual experience rather than as a motor exercise for the purpose of giving him an emotional experience. In the second place, the exposure is too short. The pupil does not have sufficient repetition of the experience to form the desired habit of reaction. His associations with poetry and poetry lovers are too slight.

The second element of form in all varieties of art is grammar, or the technique of composition. Again we may take our illustration from language. Just as words are conventionalized modes of behavior so the grammatical relations of words in the sentence are conventionalized modes of human behavior. The prepositions, the conjunctions, auxiliaries, participles, and arrangements of phrases and clauses, all involve an ordered sequence of behavior which if reproduced in fact, or in appropriate motor adjustments, will make the reading of the sentence a real motor reaction with such emotional reflex as to give the pupil a pleasurable experience, and with continued associations a definite appreciation.

The third element of form is style, including contrast, development, climax, etc. Again, style is a mode of behavior, and its beauty can be realized by the reader only as reproduced in fact, or in appropriate motor adjustment for such reproduction. The readjustments required to express adequately the contrast of place, time, condition and character in a literary selection; to respond to the development of plot and character and the climax, have their counterpart in

music, and are the basis of the experience which if sufficiently continued will result in a definite attitude or appreciation.

Response to congruence of content with personal experience—It was pointed out above that appreciation was also induced by reaction to content. This also is a motor reaction with its emotional accompaniment. This reaction may be a response to the congruence of content with personal experience or habitual behavior, or to the correspondence of content with dominant impulses, imperative needs, moods and temperaments of the pupil. One naturally reacts pleasurably to a thought which harmonizes with his own point of view, or which corroborates his own opinion. We crave justification, and so are disposed to attach great value to an expression which we feel goes to establish the correctness of our thought or behavior. This is particularly true when we have taken an unconventional position. The same principle is involved when the sermon, address, book, statue, musical composition or picture gives adequate expression to a state of mind which the individual had been unable to express adequately for himself. Much of the attractiveness of the oratory of the great political or social leader is due to the fact that he gives satisfactory expression to what the masses have wanted to say but had been unable to express. The vogue of war-time music, of folk-music and of the jazz band is explained largely on the same principle.

Pleasurable response to that which fits one's mood—We also respond pleasurably and affirmatively to those

things which fit our moods, suit our temperament, gratify our impulses, and satisfy our needs. "Misery loves company," "All the world loves a lover." The youngster pulsing with red blood is thrilled by the exploits of the adventurer. The Knights of the Round Table, Ivanhoe, and Cooper's heroes are his natural food. Later will come other impulses which as naturally crave the feeding grounds of the problem novel, biography, or philosophical discourse. And there will come those seasonal and personal experiences which make the heart find satisfaction in appropriate verse or music. The sensible teacher of literature understands that she must be guided in the selection of material by the mood of her pupils. She is quick to take advantage of special occasions and incidents. She does not undertake to thrust a song of death upon a class shouting with the joy of youth, nor to dwell upon fields of nodding daisies in mid-December. She understands that there is a situation now and then when "Snow Bound" comes "home" to the class, and when nothing else from Whittier does appeal.

Creating a favorable situation—It frequently happens that the proper situation does not arise for begetting the mood appropriate to the selection assigned. In such case it will be necessary for the teacher to create a situation through working upon the imagination of her pupils, or by means of other preparatory exercises. The point is that her labor will be ineffectual unless the selection does fit the mood or gratify a dominant impulse of her pupils. A second reason for the indifference of the average American reader to poetry is

that he does not approach it with the appropriate back ground of experience. He has not learned to make use of poetry for personal expression. It has not entered into his life; he has not experienced it. The high school can do much to correct this deficiency in preserving the naïveté of the primary school by fitting poetry to the pupil instead of the converse.

Perceiving personal relationships—Perception of the noetic relation is always conducive to appreciation. One naturally thinks well of those things which belong to himself, to his family, city or country. Insight into personal relations induces increased regard. This is particularly true of intellectual and ethical appreciation. And so the wise teacher endeavors to lead her pupils to a clear insight into the significance for human life of the thing or person studied.

Admiration of superior craftsmanship—It was suggested in a previous paragraph that we are disposed to admire the successful expression of ideas, ideals, and hopes to which we have failed to give adequate utterance. This involves the principle that appreciation is also grounded in the satisfaction derived from the assurance that one's failures or partial successes are not final, as well as upon the fact that experience in performance affords better appreciation of the master performance. The pianist of moderate experience can better appreciate the work of the artist than the listener who plays not at all. The man without surgical knowledge and experience may wonder at the skill of the great surgeon, but he cannot appreciate it as does the young assistant surgeon. A very successful

teacher of poetry depends upon this principle of execution. He leads up to the selection assigned by having his students attempt the theme of the selection in original verse. A high school teacher found her students losing interest in the critical study of Silas Marner which her curriculum required. Most of her class had formed a distaste for the book. It occurred to her to change the attack. She assumed a given incident in the plot to be changed in a significant particular and asked what effect the change would have on the outcome. A vigorous discussion ensued at once and resulted in a challenge to the class to reorganize the plot and character portrayal of the remainder of the book in harmony with the assumed change. Then followed some days of the keenest study of details of technique, of character and plot problems, of rhetorical principles, and a rare delight in what had been a bore. Literature, music and graphic art offer numerous opportunities for similar treatment.

Suggestion by the teacher—The effect of the pupil's association with the teacher should not be overlooked. Children are creatures of suggestion. They are disposed to accept and assume uncritically the standards and attitudes of persons having prestige. The teacher, if at all likable, enjoys the necessary prestige. Unconsciously the pupils imbibe her tastes. They come to like what she likes; to dismiss what she does not like. Admiring her, they admire and seek after and become what she is and admires. After all, intimate association with persons of wholesome appreciation is the most certain way to attain the same end.

IV. Summary

The psychological processes of immediate application in the teaching of high school subjects are those involved in (1) learning, (2) in memory, and (3) in appreciation.

The approach to a new topic or subject may be either Inductive or Deductive.

The inductive approach takes four steps: (1) acquisition of facts; (2) recall of related knowledge possessed by the pupil; (3) analysis, comparison, synthesis of the material secured in (1) and (2); (4) generalization and naming.

The facts necessary to induction are derived from (1) authority, (2) observation, and (3) experimentation, and properly in the order named. The related knowledge to be recalled will comprise the discoveries made in similar investigations together with any new theories which have been advanced as to the present problem.

The analysis and synthesis of data is the vital step in the inductive process: comparison should proceed systematically from one aspect to another until the data have been exhausted; generalizations should be carefully stated.

A modified form of the inductive method is employed in the development of a concept of the individual taking the form of (1) determination of those qualities or aspects which are apprehended through sense experience, and (2) examination of the relations of the thing with reference to the categories of Time and Place,

Whole and Part, Similarity and Contrast, and Cause and Effect.

The Deductive Approach is employed in many studies in the illustration of general principles by their application to particular cases. There is need of greater emphasis of the "application step" in the teaching process.

Two sets of principles need emphasis in connection with the effort to improve the efficiency of memory: those relating to Retention, and those relating to Recall.

The conditions of effective retention are: (1) native retentiveness, (2) favorable attitude, (3) strength of first impression, (4) repetition. The conditions of effective recall are: (1) association of ideas, (2) organization of knowledge.

Appreciation is a by-product rather than a process. It has three elements: enjoyment, the recognition of intrinsic worth in the object or activity, and a personal attachment or devotion to the thing.

There are four types of appreciation: the intellectual, the æsthetic, the humorous, the moral. The cultivation of appreciation in these four forms is possibly the greatest service which the school can perform.

Appreciation is the product of the emotional experiences stimulated by the elements of (1) form and (2) content in art, humor, intellectual activity, and persons. The character of the motor response to a situation determines the degree of appreciation, and the type of the stimulating situation determines the type of appreciation.

The elements of form in these stimulating situations

are: Rhythm, Technique, Style. The elements of content are the congruence of the content with the personal experience, dominant impulses, habitual behavior, and moods of the individual.

References

Bagley, William C. "The Educative Process," The Macmillan Co., New York.

Colvin, Stephen S. "An Introduction to High School Teaching," The Macmillan Co., New York.

Colvin, Stephen S. "The Learning Process," The Macmillan Co., New York.

Coursault, Jesse H. "The Principles of Education," Silver, Burdett & Co., Boston.

De Garmo, Charles. "Principles of Secondary Education," Vol. II., The Macmillan Co., New York.

De Garmo, Charles. "Æsthetic Education," C. W. Bardeen, Syracuse.

Dewey, John. "How We Think," D. C. Heath & Co., New York.

Henderson, Ernest N. "Textbook in the Principles of Education," The Macmillan Co., New York.

Holley, Charles E. "The Teacher's Technique." The Century Co., New York.

Inglis, Alexander J. "Principles of Secondary Education," Houghton Mifflin Co., Boston.

James, William. "Principles of Psychology." Henry Holt & Co., New York.

Judd, Charles H. "The Psychology of High School Subjects," Ginn & Co., Boston.

Klapper, Paul. "Principles of Educational Practice," D. Appleton & Co., New York.

NUTT, HUBERT W. "Principles of Teaching High School Pupils," The Century Co., New York.

O'SHEA, MICHAEL V. "Education as Adjustment," Longmans, Green & Co., New York.

PARKER, SAMUEL C. "Methods of Teaching in High Schools," Ginn & Co., Boston.

PARKER, DEWITT H. "The Principles of Æsthetics," Silver, Burdett & Co., Boston.

STRAYER, GEORGE D., and NORSWORTHY, NAOMI. "How to Teach," The Macmillan Co., New York.

SWIFT, EDGAR J. "Mind in the Making," Charles Scribner's Sons, New York.

THORNDIKE, EDWARD L. "Principles of Teaching," A. G. Seiler, New York.

TURNER, EDWIN A. "Essentials of Good Teaching," D. C. Heath & Co., New York.

CHAPTER IV

THE TEACHING OF HIGH SCHOOL ENGLISH

Potential values in study of English

Reverting to our study of Educational Values, it will be recalled that we concluded that the study of the vernacular and its literature has very high potential values. We observed that the ability to read well and rapidly and to express our thoughts adequately is in the highest degree a condition of success in all other studies; that the language arts are of the highest significance in practical life; that moral values are largely determined for the individual through the experience depending upon facility of communication; that social character is grounded upon those immediate and remoter relationships made possible through facility of language functions; and that excellence of one's command of English and its literary content is required above all other attainments by conventionality. The contributions of English to culture were found to be equally large. No subject in the curriculum has higher sentimental values than literature, and none is richer in content of a reconstructive character, at least none in the high school curriculum. The liberalizing possibilities and the disciplinary values are only slightly less. If our analysis is even approxi-

mately correct, the educational functions of the English course are the most significant for all classes of students, and thus it is the most important subject in the curriculum.

Objectives—The problem of the English teacher is the elaboration of a course of instruction and training which will realize these possible values. This result obviously will be consummated by accomplishing three objectives:

Facility of Expression.
Power of Interpretation.
Appreciation.

Facility of Expression involves: (a) accuracy of statement, including the choice of appropriate words and grammatical sentence construction; (b) rapidity of language functions; and (c) attractiveness or beauty of language. Power of interpretation involves skill in getting the thought readily, fully and accurately from speech as well as from the printed page. Literary appreciation includes good taste in the matter of language employed, insight into and affectionate regard for literary content, and good judgment as to the merit of literary effort.

Not a new task—These three objectives set out the task of the teacher of English. It is a large undertaking, far more than she may hope to accomplish with high school pupils, more than will be completed in college courses. But these objectives define the three lines of effort which she must pursue. She must work toward these ends, going as far as local conditions will

permit. She will recognize that they do not constitute a new task. In fact, she inherits not only the product of the elementary school but also the responsibility of continuing the processes assigned in the elementary school to the so-called language arts—reading, writing, spelling, composition and grammar. Her task is a continuation of these lines of work, not a new undertaking.

Hospital service—As a sensible person, the English teacher will recognize the implications of the fact that her work is a continuation of the program of the grade school and that in the nature of things her department must be a sort of hospital to which are brought the cripples of reading, spelling, writing and grammar courses. Ideally, her pupils should come to her well finished in these things. But a large number of them are not. Being sensible, she will set herself to removing their disabilities. They interrupt her plans for the year's work, and yet she remembers that she is to serve the pupils, fitting her work to their condition and carrying them forward as far as possible toward the goal of her department. This means that she must provide spelling classes for those who reached the high school without having learned to spell; that she must provide lessons in penmanship for those who have not learned to write legibly; lessons in phonics and the use of the dictionary for those who are defective in these respects; lessons in voice and enunciation for those whose earlier teachers have been negligent of these particulars; and lessons in grammar for the numerous victims of soft pedagogy. She must do a vast deal of such reclamation work for

two reasons: first, because the pupils have a right to it and the primary function of the high school for the many is to complete the training begun in the lower school; second, she must do it in order to go forward to new work with any promise of success.

Co-operation of all teachers necessary—But in facing her task the teacher of English has certain rights as well as responsiblities. One of her rights is the right to the active sympathetic co-operation of the entire school faculty. She may insist that her problem is necessarily shared by all of the teachers who share her pupils. In a real sense English can not be departmentalized. Our philosophy postulates that the subject-object relation can not be resolved. Form and content can not be dissociated. The word and the idea are not independent realities; rather they are aspects of the same thing. They can not be dissociated. The idea is not fully comprehended apart from its word and the word has no meaning, hence no value, apart from its idea. They can not be separated in thought or use. Hence every teacher of a "content" study must be a teacher of "form," and every teacher of a "formal" subject must be a teacher of "content." This means that no statement in science or history or mathematics is correct as to substance unless it is also correct as to the language employed. Therefore, every teacher necessarily is a language teacher. If this necessity is cheerfully recognized and all of the resources of the school properly organized, the burden of the English department will be wonderfully reduced. At the same time the work of the other departments will be equally improved.

Oral and Written English

The course in English must also be governed by the fact that language takes two forms, speech and writing. This requires that provision must be made for training in both forms. The processes of interpretation and expression are purely matters of habit. And habits are specific. That is, the skill involved in interpretation of the printed page is a specialized skill—skill in the specific process of reading; it does not carry over into the interpretation of speech. Ability to read does not involve the ability to "hear" discourse, and, conversely, the ability to apprehend adequately and appreciate the spoken word does not assure equal ability with reference to the printed word. The principle that skill is specific applies equally to composition. Facility with the pen does not assure fluency of speech, nor does ability to express oneself with accuracy and good taste in speech give equal power of written composition. Since appreciation is grounded in both expression and interpretation it follows that the training which develops appreciation of one form of discourse will not suffice for the other. From the psychology of habit in relation to language, we must conclude that provision must be made for both oral and written composition: interpretation of oral as well as written discourses; and for appreciation of the spoken as well as of the written message.

Accuracy

Depends on vocabulary mastery—Accuracy of statement is grounded in: (a) the choice of the most ap-

propriate word, and (b) proper sentence construction. The former is conditioned by the quantity or copiousness of the vocabulary and the quality of word mastery. That is, precision of statement and also of interpretation depends primarily on vocabulary mastery.[1] There is always precisely the right word for the idea; in fact the right word must be at command if the idea is to be properly apprehended. Vocabulary mastery is therefore essential to both reading and composition.

(a) *A large vocabulary must be acquired.* Choice of words is not possible unless the writer has a copious supply from which to select those which he needs. An even and ready flow of thoughts is not possible unless words come rapidly. All teachers of reading understand that the pupil's interpretation is crippled by the unfamiliar words. The embodied thought cannot be had unless the word functions so perfectly that the attention of the reader is wholly given to the content. The teacher of composition finds that the most common difficulty of her pupils is not poverty of something to say so much as poverty of means of expression —meagerness of vocabulary. The problem of the English teacher therefore, is primarily, and very largely, the problem of causing her pupils to amass a large vocabulary. This problem rests with all of the teachers of the school. The English teacher is chiefly concerned with the vocabulary of literary art, and ordinarily cannot care for the vocabularies of other departments, each of which employs an extensive set

1 "The Century Vocabulary Builder" by GARLAND GREEVER and JOSEPH M. BACHELOR is an excellent book for Students' and for Teachers' reference.

of words peculiar to its subject matter. Thus the terminology of science will not be mastered unless the science teacher accepts the responsibility of securing this result. Likewise with mathematics, the vocational subjects, and history. History employs a large vocabulary of proper names whose mastery is necessary if the student is to get an intelligent understanding of the subject matter. From the standpoint of the learning process as well as from that of the linguist words are precious. The world of thought is enormously expanded by the creation and use of words. It is little wonder that man for long ages thought of himself as absolutely distinct from the rest of the animal kingdom. Man lives in a world of words; the animals live in a world of things and memories of things. To those who can use words so as to influence the rest of us, we give society's greatest rewards. To the combinations of ideas which we have worked out in words we owe changes that have later been wrought out in things. In short, our civilization differs from primitive conditions chiefly because the economical methods of thought and action made possible by words have transformed our relation to the world and put at man's disposal forces which could not have been discovered or mastered without the higher modes of abstract thought.

(b) *The vocabulary must be mastered as to its form.* That is, the pupil must be trained to ready, accurate, and pleasing utterance. The mutilated word does not function properly either in process of expression or in interpretation. Pronunciation, enunciation, vocalizing, have their psychological as well as their æsthetic value. The word is a mode of behavior, and as such

its meaning has become inextricably associated with its oral form. If sounds are omitted, syllables slurred, accent misplaced, wrong vocals sounded, and final consonants dropped, the real word with which the meaning is associated is not employed, but instead a mongrel whose content lacks definition and fullness. There is a logical necessity for greater attention to the elementary matters of pronunciation and the musical quality of oral language. As indicated in an earlier paragraph this is largely a question of proper example on the part of the teachers and of habit formation. This problem also rests with the entire school faculty. It is only by patient and constant co-operation of all the teachers that proper habits may be established.

But words must also be spelled correctly. Good spelling is not wholly a matter of taste, although it is required in good manners. Spelling is even more essential to facile reading than to composition. New words have a written form as well as an oral form, and no amount of previous training will relieve the teacher of the need of teaching their spelling. This also is a responsibility which departmental teachers will share. Spelling lessons are as necessary in mathematics, science and history classes of high school and college as in the elementary school.

(c) *The vocabulary should be organized.* In order to facilitate the choice of words as to shades of meaning and also to secure variety in composition, it is profitable to group words on the basis of their common content, noting differences of meaning. This exercise will develop a lively consciousness of word values in addition to the increased command of vocabulary. It

will greatly increase precision of interpretation and statement, and equip the pupil with the primary essential of good style.

(d) *The vocabulary must be mastered as to its content.* It will be sufficient to say in this connection that the hasty and superficial thought usually given to the meaning of the new word is exceedingly wasteful. If the word has even a fraction of the logical value claimed for it, its meaning, or several meanings, are worthy of definite study and discussion.

If the pupils have had no definite training in vocabulary, the foregoing program will impose a huge task upon the English teacher. But if they have been systematically trained to acquire every new word with which they have met from their entrance in the primary school, the task will not be formidable. Once the habit of word mastery is fastened upon the individual the teacher's work is largely done.

Sentence Construction

The unit of the thought process is the judgment; the judgment is expressed in the sentence. Hence the sentence is the unit of composition, and accuracy of statement depends upon such construction of the sentence that the judgment is fully expressed, without a possible misinterpretation. Training for sentence making will involve the study of those principles of grammar generally presented in the textbooks on rhetoric, which might well be supplemented by a consideration of the principles of definition and division as treated in logic; much study of the sentence structure of stand-

ard authors for the purpose of determining the principles by which they are guided; and, chiefly, abundant practice. Sentence making is an art which comes like all arts—from long, patient, intelligent practice. The writer understands that most readers will pronounce these statements trite, and they would be unpardonable if most English teachers really attempted to do these things. In the first place, the study of principles is generally abstract and dogmatic. It is more effective to develop them as generalizations of the pupil's observation of the practice of trained writers and from his experience in experimental writing. In the second place, far more should be made of imitation. The teacher of English may well take a leaf from the pedagogy of the Ancient Greeks. They have not been surpassed as teachers of composition. Their method was based on the impulse of imitation. Their exercises consisted of writing from dictation of standard Greek prose and verse, followed by detailed comparison of the pupil's effort with the model, discussion of errors, and rewriting. After the boys had become skilful in the mechanics of sentence making and had "caught" the diction of the author, they were set to the composition of original efforts imitating the methods of their model. In the third place, art is "caught" not taught —caught in long, patient, intelligent practice. Much of the practice of the schools is neither long, patient, nor intelligent. Too generally the pupils are hurried on to paragraph writing and larger elements of discourse. They are set to writing productions before they have learned to "play the scales." We feel that the poor English product of the high school at present

is sufficient evidence of the error of placing the emphasis on paragraph writing. The paragraph is not the unit, and no matter how well the pupil conforms to the principles of paragraph writing, an orderly well balanced sequence of lame sentences can not become good English. The experimentation of recent years should satisfy all teachers that larger emphasis of the sentence and extensive practice in sentence writing will produce more satisfactory results. Besides, the practice that is secured is too frequently of a perfunctory character. It does not bring out the deliberate effort of the pupil to solve a problem—the problem of giving the best possible form to judgment, consciously applying the principles of sentence writing which he has elaborated in personal study, and guided by an accepted model. Effective practice must do just these things, and in addition must be critical. But the criticism should be made by the writer under the supervision of the teacher rather than by the teacher or other pupils. The teacher should be director of practice and criticism rather than critic of practice. The wise teacher will strive to develop in the pupil a critical attitude toward his own work, and train him in a method of testing it. In mathematics and science the student is taught a system of "checks" by means of which he may determine for himself the accuracy of his results. The teacher of English may secure a like advantage by converting the principles of sentence construction into a set of "checks" which the pupil is trained to apply to his own work. Her task may be summarized in some such fashion as follows:

(1) To give the pupil a clear conception of what constitutes a good sentence;

(2) A model which he may follow;

(3) The ambition to write good sentences;

(4) A method of testing his work;

(5) Opportunity for ample practice and personal conference with the teacher.

With sentence writing mastered, it is not difficult to pass to the paragraph and larger exercises. The problem takes the form of organization of thought with such modification of the sentence unit as will secure variety within the unity of thought.

Rapidity of the Language Function

Facility of expression, we have said, depends upon three factors: accuracy of statement, rapidity of the language function, and attractiveness of expression. We have discussed the first factor, accuracy of statement, and dwelt at some length upon the importance, for both interpretation and expression, of the intimate mastery of a copious and well organized vocabulary, and of skill in sentence writing. Let us now consider the second condition of facility of expression—the rapidity of language processes.

Rate of thinking and rate of word recall—First of all, thought cannot travel faster than the flow of words. In fact, mental tests employ the rate of word recall as a measure of mental ability. The volume of thought, then, will be conditioned by the rapidity with which words are recalled and perform their functions. In reading this is quite evident. The rate of reading,

that is, of thought getting, is measured by the rapidity of recognition of words and the functioning of their associations. The rate of language processes is a matter of practical importance. It is equally important in expressing thought. Every teacher is familiar with the interruption of thought processes which occurs when the pupil must give his attention to the recall of words and principles of grammatical construction. How is the rate of language functions determined, and how may greater rapidity be secured? In all mental processes there are individual differences. Some persons are so organized nervously that they react more rapidly than is possible for others. There are then inherited limitations beyond which it is not possible for the school to develop the pupil. But aside from these native limitations language processes are governed by the laws of memory, and the principles governing memory processes will apply to language functions. Applying the principle of recall, the organization of vocabulary into groups of words associated in meaning and which the pupils are trained to distinguish as to shades of meaning, will accelerate the flow of words. Frequent repetition of these groups by calling a member and asking for its associates will be helpful. Rapid silent reading of properly graded material will serve the same purpose. Story telling is also of great value in this connection. Much may be accomplished by speeding up the foregoing and other exercises. Rapid exercises in recall of opposites, derivatives, correlative terms and the like give good results. A very common exercise of the same character is the requirement of a written news report

in a ten minute limit. The rate of language process is determined by the familiarity of the individual with a large vocabulary, and development of speed will contribute to the end in view. The point to be emphasized in this paragraph is the importance of working for rapidity as well as accuracy.

The Art of Interpretation

Skill in getting the thought from the printed page and from oral discourse is conditioned first of all by the individual's mastery of vocabulary. Nothing more need be said on this point after the emphasis given in the discussion in a former paragraph. A second condition is the individual's power to analyze and synthesize the sentence—his readiness in conceiving the grammatical relations involved in the sentence. We have also discussed this point. It is pertinent, however, to add a word in behalf of an almost lost art which formerly had great vogue in the schools. Formal grammar has few friends in these days of the new pedagogy. If grammar could not be taught except as an abstract science dogmatically forced upon immature minds and for no reason except for the alleged value of helping the learner to "speak and write correctly," the criticisms which have all but banished the subject from the schools could be justified. But grammar may be taught as a concrete subject, as a normative science, and inductively. Taught thus it has great value in composition, especially as providing the checks for self-criticism. Grammar thus taught has even more value as a preparation for reading. To

read means to analyze and parse the sentence, and then to synthesize the elements of thought thus revealed into the judgment embodied within the sentence. The more rapidly, accurately and automatically this grammatical survey is made, the more it falls to the background of consciousness, and the more efficient the interpretative process. A revival of grammar with improved methods of teaching the subject is very much to be desired as a means to better reading.

Rightly conceiving mental images—A third condition of efficient interpretation, especially of the printed page, is rightly conceiving the mental images employed. This involves the training of imagination, a mental function which is largely ignored above the primary school. It is obvious that the grasp of the content of a selection dealing with a concrete subject makes the use of the pupil's imagination necessary. The same necessity occurs in the reading of philosophical matter. To be dynamic the concept must be clothed in some variety of concrete imagery, and to interpret an abtruse dissertation the reader's mind must be resourceful in calling up an appropriate illustrative imagery. This may be accomplished largely by getting the pupil into the right attitude toward the implied situation. He may be the story teller or the audience; the patient lecturer or the listener, or the participating characters. He must be led to frame in the picture, to graduate the lights which fall upon it, to participate. This reaction is especially necessary in the reading of poetry, in which the embodiment so frequently, as in the epic and the narrative poem, takes

the form of a series of mental pictures. Much more may profitably be made of the dramatic impulse of the reader.

Motor reaction to the selection—A fourth condition will be discussed in greater detail in connection with the consideration of appreciation; namely, word and motor reactions to the language. It is sufficient at this point merely to say that both are factors in the getting of the thought as well as in developing appreciation. The point of view of the author or speaker, his motor reaction to the language he employs, his emotional state, have much to do with the organization of his thought. They constitute the "logical universe" within which his mind operates, the major premise of his thought. Clearly the reader must approach as nearly as possible the same point of view and be moved by the same motor and feeling reactions if he is to follow in the author's mental processes.

Critical attitude toward the selection—The fifth condition is a method of attack. To read means more than to subject one's mind to the play of the author's words. To "take in" a speaker's message implies more than passive surrender to his discourse. To read is to act, to attack, to react to the language of the page. The distinction is simple but of enormous significance. The passivity of the child in the primary class in which the pronouncing of words passes for reading has its parallel in the adult who "does" the latest book in the same fashion in which one of Cook's tourists does Europe, or Young America sees his native country from his racing car at fifty miles an hour. The American people consume countless tons of paper

but read very little. As evidence, note the quantity of matter over which they skim, the scare-heads of the metropolitan daily, and the short story. To read means to analyze, to synthesize, to reflect, to prove, to evaluate. This requires an active, questioning attitude, and a certain judicial disposition toward the matter under perusal. Obviously our schools must do more for our pupils than give them facility of vocabulary. In the subsequent pages certain outlines are given for the study of literary classics. These schemes are suggested not so much for their helpfulness in class study as because they offer a plan of training which will result in the development of a critical habit of mind in the pupils. The lesson plans suggested are not the only ones possible, and may not be the best which may be devised, but they have the merit of exercising the student in a definite mode of attack upon that which he reads. The point which the writer wishes to make here is the importance of habituating the pupil to an active and systematic reaction to the press. A public which reads voluminously but noncritically is a dangerous public, ready material for mobs and revolutions. A public which reads critically, categorically, which subjects every proposition to analysis, which reacts individually to what it reads, is a safe democracy in fact, whatever the form of the government. The school will accomplish much of this by training its pupils in literary analysis.

Appreciation

Possibly enough was said of the processes involved in the development of appreciation in a former chap-

ter. The reader will recall that its tri-phasal character was pointed out: first, the element of enjoyment; second, the element of judgment, or the conviction of the intrinsic value of the object; third, the element of devotion, or disposition to encourage and defend. He will also recall that appreciation is a large factor in the making of personality, both through its recreative and its formative values; and that it is a sort of by-product of studies rather than a process or subject of direct attainment. It was explained as the product of the emotional experiences which accompany the motor responses brought out through the stimulation of elements of form and content of studies.

This review indicates the significance for life of literary appreciation. We are accustomed to think of books as the embodiment of the culture of the race and hence as the channels through which the humanity of the past generations is transmitted and transmuted into the personality of the readers of this generation. The "cultural values" of literature are derived for the pupil through the cultivation of his appreciation. In our analysis of educational values we gave literature the highest rank of all high school studies in the nurture of personality. This objective then is of equal importance to the teacher of English.

Literary taste—Appreciation also involves what is called literary taste, or judgment of the relative value of literary material. Its importance to the pupil as a guide to what is worth reading outside of the school list is apparent. The school desires to make him independent, to train him for self-direction. It is highly important that he shall acquire judgment of literary

values that he may safely discriminate among the thousands of books thrust at him. In this relation, appreciation is a significant factor in that critical attitude for which we argued in the preceding chapter.

The teacher will be quick to discern that appreciation will react immediately upon the pupil's application to his English studies. What one loves he strives to attain. Enjoyment of splendid language stimulates effort to use good language, makes the pupil more open to suggestion, quicker to imitate, more zealous in his efforts.

Emotional experience—The statement made above of the mental processes involved in appreciation indicates the requirements as to method in developing literary appreciation. It is secured as the product of the emotional experience of the pupil in his motor reaction to the form and content of the literature studied. This requires that the study of a selection shall be more than a mere logical exercise; that the study shall be so directed as to produce a definite motor reaction in the pupil. The corresponding emotional experience will accompany this motor reaction. The psychological basis of this proposition was explained in the chapter on mental processes, and the illustrations were largely drawn from the study of literature. It was pointed out there that words are a mode of behavior, sensed only by participating in that behavior with voice, posture, and action. A literary character also is a mode of behavior which one can truly realize only by participating in the situations and reactions which the character experienced. Likewise with incidents, scenes, plots, situations. Even a

didactic essay is the behavior of the person who is teaching or lecturing, and its appreciation will be determined by the reader's participation in that behavior. In fact, all literature is dramatic, because it is human. For every reason a dramatic element or quality must be found in every selection, and the reader so situated that he is led naturally to participate in such movement or attitude.

Reaction to content—It was also pointed out in the definition referred to that there are reactions to content, and that these are stimulated by the relation of the character and plot of the selection to the mood of the reader, and to his native impulses and his needs. This principle will guide the teacher in setting the time for presenting the production and in the method of introducing the pupils to the content. It is evident that much of her thought must be given to devising appropriate situations for securing the desired reactions. Sometimes these occur naturally, but more often it is necessary to build a background of thought. The illustrations employed in the chapter on Mental Processes will make the application of this principle sufficiently clear.

Summary

The educational functions of the English courses are the most significant for all classes of students, and hence it is the most important subject in the secondary program. The objectives to be accomplished are (1) facility of expression, (2) power of interpretation, (3) appreciation.

The high school English teacher will recognize that her work is a continuation of the program of the preceding grades, and that her department must be a sort of hospital to which are brought the cripples of reading, spelling, writing and grammar courses of earlier years.

In a real sense, English cannot be departmentalized. The English teacher may insist that her problems are necessarily shared by all the teachers who share her pupils. There should be close co-operation of all teachers of the pupil in perfecting his English.

Oral and written English should have equal emphasis.

Facility of expression is secured through (1) accuracy of statement, (2) rapidity of the language function, and (3) attractiveness of expression.

Accuracy of expression depends upon (1) the mastery of a copious vocabulary as to both form and meaning, and (2) skill in sentence construction.

Rapidity of the language function is basically determined by the mental constitution of the child but may be improved by increased familiarity with a large vocabulary and by drill for speed. Attractiveness of expression is partly a matter of personality, but largely the result of painstaking practice after good models, and under stimulating criticism of a teacher who possesses literary ability.

The art of interpretation is conditioned by several factors: vocabulary mastery, readiness in conceiving the grammatical relations involved in the sentence, rightly conceiving the mental imagery, the natural

motor reaction to the selection, and an active attitude toward the meaning of the selection.

The cultural values of literature are secured for the pupil through the cultivation of appreciation of books. The love of good books is of the most vital significance to the individual, and hence the development of literary taste, or judgment of the relative value of literary material, is the real objective in the literature courses.

References

BAIN, ALEXANDER. "On Teaching English," D. Appleton & Co., New York.

BARNETT, PERCY. A. "Common Sense in Education and Teaching," Longmans, Green & Co., New York.

CHUBB, PERCIVAL E. "The Teaching of English," The Macmillan Co., New York.

CORSON, HIRAM. "The Aims of Literary Study," The Macmillan Co., New York.

CORSON, HIRAM. "The Voice and Spiritual Education," The Macmillan Co., New York.

Education. 26:36, 27:628, 31:449, 30:421, 28:537, 24:426, 28:15, 31:639, 28:306, 24:348, 23:15, 28:608.

Educational Review. 8:290, 41:510, 31:198, 33:402, 7:240, 30:303, 3:37, 21:11.

FAIRCHILD, ARTHUR H. R. "The Teaching of Poetry in the High Schools," Houghton Mifflin Co., Boston.

GAYLEY, CHARLES M., AND BRADLEY, CORNELIUS B. "Suggestions to Teachers of English in the Secondary Schools," University of California, Berkeley, Calif.

HINSDALE, BURKE A. "Teaching the Language-Arts," D. Appleton & Co., New York.

Hosic, James F. "Reorganization of English in Secondary Schools," U. S. Bureau of Education Bulletin, 1917, No. 20.

School Review. 16:492, 15:731, 16:73, 5:7.

The Nation. 86:463, 20:208, 91:333, 86:303.

CHAPTER V

METHODS IN ENGLISH (Continued)

Two phases of English instruction—As conventionally organized the English work of the high school is presented in two phases: composition, including grammar and rhetoric, and literature, including the history of literature and the art of literary analysis or interpretation. Necessarily there must be some differentiation of these two phases of the English course, particularly to bring out clearly the principles of grammar and rhetoric, but on the whole, experience shows that best results are secured by treating composition and literature as one subject, the composition practice drawing upon the literary selections studied for models and themes, and being employed in turn as a means of more effective study of the classic. The advantages of presenting English as a unified subject having two aspects rather than as a combination of two distinct and but slightly correlated courses, will be apparent as we proceed with the discussion in the following pages.

Composition

The objective on the side of composition and rhetoric is facility of expression as defined in the preceding chapter. This result will be secured in part through

the special instruction and practice required in the departmental classroom, and in part by the requirement of good English, both oral and written, by the teachers of other subjects. It is not too much to say that this co-operation of the teachers in other departments may contribute more to the desired end than the work of the teacher of English can accomplish if she fails to secure this co-operation. Possibly enough has been said of the importance of holding all members of the faculty responsible for the excellence of the language employed by their students. It will be recalled that this requirement was urged upon two grounds: upon the ground of its necessity in securing accurate thinking and clear concepts, as well as in furthering the interests of good English. The slogan should be, "Every teacher is a teacher of English." Every teacher should hold his pupils rigidly responsible for accuracy of statement, for choice of the right word, for proper sentence construction, paragraphing, spelling, punctuation, and pronunciation. If other teachers to whom the pupil recites permit any carelessness with reference to these matters, thus violating the most vital principle of habit formation, the labor of the special teacher will be largely wasted. It is well known that most of the errors of pupils are due to carelessness rather than to ignorance. The only remedy possible is proper habituation. It is the duty of the principal of the school to see that his pupils are under constant and even pressure for their best language. Again, the importance of the matter justifies us in calling attention once more to the responsibility of the teachers of content studies for the mastery of

both the general and special vocabularies of their subjects. The pupil has no other opportunity for acquiring the latter, and much of the general vocabulary employed in textbooks on science and mathematics will not be found in the material of the literature courses. It should be understood then that teachers of these subjects will make sure that the pupils thoroughly learn every new word as to pronunciation and spelling as well as to its meaning.

The formal instruction in composition and rhetoric will include four lines of work: Vocabulary Mastery, Grammar, Rhetoric, and Composition Practice.

Vocabulary mastery—Of these four, obviously the first is the most vital and at the same time the most neglected. More distress results from poverty of words than from poverty of ideas. The idea is not available for use even if it were possible for the mind to entertain it until the proper word is at hand for its communication. Fluency of thought is made possible by fluency of words. The first effort of the teacher therefore should be to give the pupil a large working vocabulary. Meanings, shades of meaning, derivatives, paronymous terms, must be carefully distinguished and sufficient practice provided for fixing these distinctions in the speech habits of the student. It is as necessary to attend to details of pronunciation and spelling of these new words as with the vocabularies of the elementary school. It is also necessary to give attention to habits of enunciation. No matter how well the elementary teacher may have done her work, the insidious influence of the slovenly speech to which the pupil is constantly subjected will lead him to care-

lessness in enunciation. It is of the utmost consequence, especially to the pupil who will leave the high school to enter at once upon his vocation, that he shall be trained out of those many little faults of voice which seriously reduce one's efficiency. At the least he should have his attention directed constantly to such defects, and should have a proper example in the well modulated voice and pure tones of his teacher. Strangely enough the American people are exceedingly sensitive to good voices and yet indifferent to the great value of a properly developed speaking voice. The high school could do nothing of more profit and pleasure to its pupils than to require of each an elementary course in voice culture. Corresponding to this phase of oral speech training, equal attention should be given to the pupil's penmanship and to the form of his paper work in general. The pupil has the right to be required to develop a legible style of writing. The teacher is inexcusable who passes him on without an honest effort to correct deficiencies in his handwriting.

What to emphasize in grammar—It is sufficient to emphasize those elements of grammar that are vital to accurate sentence construction as they become necessary. There is no good reason for study of the subject as a science. Whatever values might be derived from such study will be more effectively secured in the learning of a foreign language. It will be found advisable to drill the pupils rather thoroughly on modifications—tense forms, auxiliaries, case and number forms of nouns and pronouns, and comparison of adjectives and adverbs. The rules of punctuation will re-

quire re-study, and the position-value of words, phrases and clauses must have careful attention. The amount of time that should be devoted to these and other points of grammar will be determined by the deficiencies revealed in the composition work.

How rhetoric should be introduced—It is likewise recommended that rhetoric be not presented as a science, but that those principles be taught which are necessary to intelligent composition and self-criticism. The main emphasis should be laid on the organization of thought for expression. Naturally the principles of organization will be worked out with reference to the type of composition undertaken. With the subject matter properly analyzed and synthesized, the problem of the paragraph will present little difficulty. Unity, force and clearness will also be secured. Style is caught rather than taught—caught through conscious and unconscious imitation of models. It is advisable to work for style in this way. The study of principles of style has little value except for literary criticism, which obviously lies beyond the ability of the high school student.

Conditions of profitable practice—To be really profitable composition practice must satisfy three conditions, and since at least two of these are usually not secured we feel justified in emphasizing their importance at some length. These three conditions are:

(1) The exercise must involve the pupil's best effort;

(2) The writing must be done under the guidance of a conscious standard;

(3) There must be some practice, with painstaking criticism, personal conference, and rewriting.

Motivation of the composition exercise—Effective practice must involve the writer's best effort, directed toward an accepted standard of excellence. Perfunctory writing, merely at the command of authority, is worse than a waste of time. The first step in a practice exercise is the adequate *motivation* of the pupil. This can be accomplished in but *one* way,—to create a situation in which the pupil has

(1) An audience,
(2) To which he wants to say something,
(3) Which he has to say,
(4) In his best possible manner.

Finding an audience—The teacher's problem is to create the situation. First, the audience must be found. The poet may develop a fine frenzy with no particular reader in mind because in his imagination the whole world is held in wrapt attention. But the high school boy lives closer to earth. He must have a real and known audience. To him, speech is communication from speaker to hearer, and the normal boy finds no sufficient motive in speaking without some one to hear. The necessary audience must be found. It must be sympathetic, receptive, expectant. Under some circumstances the teacher herself may be a sufficient audience. Under others, particularly if the content comes out of the exclusive experience of the speaker, the class may satisfy the requirements. Occasionally, other classes or the school as a whole may be utilized. In written exercises the readers of the school paper will furnish a splendidly motivating

audience. The great value of letter writing as a form of practice is due to the fact that the communication goes to a sympathetic, expectant reader. However procured, an audience must be found, and it must be expectant of something new,—new information or old information in a new form.

Desire to address the audience—In the second place, the writer must want to address the audience. This desire will follow their sympathy and expectancy if he has *something of his own* to say. The latter condition involves the selection of the theme. This will be determined in part by the range of the pupil's experience. Obviously the teacher will not make the mistake of assigning a subject about which the pupil knows nothing, nor will she make the equally foolish blunder of asking him to discuss a subject about which his hearers know as much as himself. He must feel that his effort makes an original contribution to the audience. That is, the audience to be addressed as well as the writer's experience, must be considered in the selection of the theme.

The desire to please—Again, the pupil's motivation for expressing himself in his best form is determined by his attitude toward the audience. If this is so selected as to stimulate his desire for approval, or to please, he will anxiously strive to do his best. Thus the whole problem of motivation turns around the proper relating of the writer to an audience. This shifts the center of gravity largely beyond the choice of the themes, which generally commands most of the attention. But the psychology of the boy requires it. He finds neither sport nor profit in firing his rifle in

the air. He finds some sport in firing at a target, but it takes live game to get the best out of him.

Selection of proper models—The second step in a composition exercise is the selection of an appropriate model. Experience has taught us that both time and labor are conserved in the learning of any art by setting before the novice a standard of excellence within the range of his possible attainment. Such standard gives direction and definiteness to his effort, reveals his deficiencies, and suggests to him the nature of improvement necessary. Modern pedagogy has seized upon this principle in devising objective standards for the measurement of the school product. The history of standard authors reveals the same fact; namely, that very few invented their own styles, but that most of them "worked after" adopted models whose styles they modified to suit personal characteristics and limitations. The same thing is true of painters and musicians. Far more positive results are secured if the boy undertakes to describe an odd character as Irving or Dickens would have done. Many of the editorial pages of our better newspapers and periodicals afford excellent models for profitable essay practice. Even the textbooks used by the pupils in their other subjects will be suggestive of proper presentation of a mechanical device or of a nature observation. Many of the special newspaper correspondents offer valuable suggestions for young students. The teacher will find it easy to procure a sufficient variety of models for all kinds of subject matter and all types of writers to afford precisely the guidance needed. She will find this practice not only effective in develop-

ing style, but equally helpful in correcting idiosyncracies of individual pupils.

The value of good writing materials—There is a real value in providing the best writing materials for practice work. If an assignment is worthy of the pupil's effort, it is worthy of the best quality of paper and ink. Cheap materials have a bad suggestion. They beget slovenliness of thought. The best grade of materials suggests permanence of product and this stimulates effort. The penny pad and dull ink should be forbidden. This applies to first drafts as well as to the final writing. Another object whose suggestion is harmful is the ubiquitous waste basket. It is next to impossible for the boy to take seriously anything which he knows is destined to be tossed aside. Many of our teachers have found it wise to preserve at least to the end of the year all exercises, including first drafts as well as the finished papers. They find that pupils unconsciously take more care with work which they feel is to be permanent. It is entirely natural that they should react to such suggestion.

Criticism of pupils' exercises—The pupil has the right to have his work faithfully appraised, his merits recognized, and his errors indicated. This means that the composition exercises must be carefully criticized, and that the criticism must take account of excellence as well as weakness. It means also that errors shall be marked and treated in such way that the pupil may proceed intelligently to eliminate them in rewriting. This involves a vast deal of drudgery on the part of the teacher, but there is no escape from it. As a matter of economy of time and stimulation as well,

the pupil should be called into personal conference on his exercises. A brief sympathetic interview with a suggestion as to improvements of the paper will secure a livelier response from the pupil and rapid decrease of errors. The only feasible plan for relieving the load of the teacher is to employ a sufficient number of assistants to enable her to section the class into small groups. The more personal the relation of critic and pupil can be made the more effective will be the criticism.

The amount of rewriting should be governed by the attitude of the pupil and the excellence of his work. There will be little profit in further work on an exercise after it has become distasteful, or after the pupil has approached the limit of his ability. A very good rule is to continue the revision as long as the pupil is ambitious to improve this particular exercise provided further improvement commensurate with the labor it would require, is possible.

Oral composition—The foregoing applies to oral as well as to written composition. It may be well to remind the teacher again of the importance of much oral practice. From the practical point of view the ability to speak well is of more value than the ability to write well. Certainly we must express ourselves orally much oftener than we are required to write. The conventional value also is greater. The art of pleasing conversation, the ability to talk well, to tell a good story, opens the door to the most coveted recognition. This ability comes by training. There are some mental traits more favorable to such development than others, yet any pupil may be trained to speak as well

as to write, and the ability to do so will be of inestimable value. The principles which govern oral practice are the same as in written composition. The pupil must have a sympathetic, expectant audience; something of his own which he wants to contribute; the desire to impress his audience in a definite way. He should have good examples in his teachers and appropriate models to guide him in his formal efforts. His efforts should be followed by a sympathetic, appreciative criticism in personal conference. Abundant opportunities for oral practice may be provided in the class exercises of other departments in the form of class discussions and individual reports. In the English class he may be given practice in story telling, book reports, talks on topics drawn from his other studies, reports on current events, reports on his personal enterprises, and sketches of prominent persons. The last exercise offers splendid opportunity for good composition-situations and, at the same time, for the acquisition on the part of the class of valuable information for which provision ordinarily is not made elsewhere in the school. It will be quite profitable to introduce the pupils in this manner to the leading personalities in the present world of finance, industry, education, religion, science, art, sport, society, etc.

The Study of Literature

Two objectives—In the preceding chapter it was pointed out that the teaching of English has three objectives; namely, the facility of expression, the art of interpretation, and appreciation of the beautiful

as portrayed in literary art. The first of these is realized principally in the composition phase of English. The second and third objectives are attained principally through the study of literary classics. However, each phase of the subject contributes to the others. Skill in composition certainly develops power of interpretation and leads to the highest appreciation of language as an art. On the other hand, the study of literary classics, as indicated in the former paragraphs, contributes directly to increased facility of expression.

Literature is a conspicuous part of the history of man. It is one expression of man's effort to raise his civilization to higher levels. It draws much of its significance for the reader of to-day as well as its content from the historical background upon which it rests and the social forces which gave it being. For this reason it is necessary for the student of literature to approach the subject with a proper conception of the historical setting. It is, of course, desirable for the student to have acquaintance with the lives of authors, and their place in the development of literature. But it is more vital to understand their connection with the current of thought and faith, with political and industrial movements, with the unfolding life of the nations. There should, therefore, be a close correlation of the course in literature with the course in history.

Three requirements must be satisfied—In view of the two objectives which are primarily the business of the course in literature, the curriculum must be organized to satisfy these requirements. First, the material

selected for study must represent all of the several types of literature in order that the pupil may acquire the method of interpretation appropriate to each. Second, these selections must be so made as to give a general introduction to literature as an aspect of human history. That is, the whole range of literature as to nations and periods of history must be represented. Third, the selections must include the great masterpieces which are adapted to the abilities of high school pupils. It is beyond the province of this discussion to propose a program of studies other than to say, as a basis for the suggestions as to method which follow, that such program should represent the following literary types:

Poetry.
  Narrative—Epic, Metrical Romance, Ballad, Allegory.
  Descriptive Poetry.
  Lyric—Song, Ode, Sonnet.
  Dramatic—Tragedy, Comedy.
Fiction.
Essay.
Oration.
Narrative and Descriptive Prose.

Suggested plans for study of literary classics—It is not possible within the compass of this volume to enter into a detailed discussion of methods of teaching these various types of literature, but the lesson plans outlined below will show a method of attack which has proved quite satisfactory in developing appreciation and also in making the pupil independent in his own reading.

The suggestions are adapted from Heydrick's "How to Study Literature."

Plans for Study of Literary Selections

1. General Study (the same for all types).
   1. Read the entire selection through.
   2. Master the vocabulary.
   3. Study figurative expressions.
   4. Study the allusions.
   5. Study the mental pictures.
2. Critical Study.
   a. Of Narrative Poems.
      1. Is the author's purpose to
         Entertain?
         Elevate the mind?
         Express an opinion of the author? or
         Enforce a moral lesson?
      2. Trace the plot.
      3. The setting, time, place, and other conditions.
      4. Study the characters: traits; physical, mental.
      5. Contrasts of character, of plot, of action, of mood.
      6. Style.
      7. Meter.
      8. Select suitable passages for memorizing.
   b. Of Lyric Poems.
      1. The Theme: The central and secondary themes.
      2. Mood: Which of the following words express it: tender, dreamy, sentimental, vague,

strong, intense, passionate, extravagant, light, fanciful, cheerful, reckless, exalted, triumphant, spiritual, humorous, witty, satirical, pathetic?

3. Movement: Which word describes it: Smooth, slow, dignified, stately, solemn, light, swift, rippling, rollicking, easy, graceful, spirited, powerful, regular, varied, irregular, uneven, halting?
4. Sound:
   Is it musical?
   Is the music sweet, powerful, or delicate?
   Are there any harsh words or lines?
   Are there imitative words?
   Is there alliteration?
   Does the author use refrain?
5. Structure: Rhyme, meter.
6. Diction:
   Simple, colloquial, idiomatic?
   Elevated, polished, ornate?
7. Style: Has the poem grace, spontaneity, delicacy, dignity, grandeur, strength, intensity, passion?
   Beauty of sentiment? of description?
   Profusion of imagery?

c. Of Dramatic Poetry.

1. The Plot:
   Is it simple or complex?
   Are the events probable?
   Is the play easily followed or is it confusing?
   What is the source of the plot?

If borrowed, from what? How much is it modified?

2. The Setting:
   1. When did the events occur?
   2. How much time do they occupy?
   3. Where is the action laid?
   4. Are these places real or imaginary?
   5. Is the play true to history?
   6. The physical environment.
3. The Characters:
   1. Who is the central figure in the play?
   2. Are there others associated with him to form a group?
   3. Are there other groups? The central figure in each?
   4. How are the groups connected?
   5. Are the characters clearly distinguished, life-like? Are men or women more prominent?
   6. The characters:
      1. Make a summary of the traits of character of each.
      2. Is each stationary or developing?
      3. Describe the make-up, voice and action of the impersonator.
   7. What contrasts are employed: of plot, character, action?
   8. What parallels if any are introduced?
   9. Where does the rising action begin? the falling action? Is there dramatic foreshadowing?
   10. Style (See Lyric Poetry).

d. Of Fiction.
   1. The title. What purpose does it serve?
   2. Is the purpose of the novel to entertain, present a historical picture, teach a moral lesson, advocate a cause, or give a picture of life as it is?
   3. The Plot:
      1. Trace the plot.
      2. If complex, how many and what stories are interwoven? How connected to give unity?
      3. What is the climax of the story?
      4. If the author employs suspense, where?
      5. What are the best chapters in the book?
      6. Assume the plot changed at critical points and complete it in harmony with the assumed change.
   4. The Characters:
      1. From what classes of society drawn?
      2. Are they natural? Are they consistent?
      3. Stationary or developing?
      4. What are the physical and mental characteristics of each of the principal characters?
      5. What is the author's ideal man? Woman?
      6. Assuming that the book is to be dramatized describe the make-up, voice and action of each character.
   5. Contrasts: Of character, plot, mood, description?
   6. Style: Is it epigrammatic, humorous, direct, animated, brilliant, artificial, bookish, dull, eccentric, confused, disjoined, obscure?
   7. The Diction: Simple, idiomatic, colloquial,

polished, elevated, dignified, terse, vigorous, picturesque?

e. Of the Essay, Oration, and Narrative and Descriptive Prose.

1. Is it a Narrative, Critical, Didactic, or Personal Essay?
2. Structure:

   The Introduction: Where does it end? What does it serve?

   Body: Where does it begin? Where end? What the principal subject treated?

   Conclusion: Where does it begin? What purpose does it serve?
3. If a Narrative Essay are the events told in time order or in order of cause and effect?
4. If a Critical Essay is the author fair in his praise and criticism?
5. Make an outline of the essay by paragraphs, stating the substance of each in a sentence.
6. Characterize style and diction as in outline for other types of literature.

Summary

Formal instruction in composition and rhetoric will include four lines of work: (1) vocabulary mastery, (2) grammar, (3) rhetoric, (4) composition practice. Special emphasis should be given to the acquisition of a copious vocabulary, to perfecting the speaking voice, to the quality of paper work, to those elements of grammar that are involved in sentence structure, and to the organization of the thought.

Three conditions are essential to effective composition practice: (1) the pupil's best effort, (2) the guidance of a conscious standard, (3) intelligent criticism and rewriting. Adequate motivation is provided in a situation in which the pupil has (1) an audience, (2) to which he wants to say something (3) which he has to say in (4) his best possible manner. This applies equally to oral and written composition.

Much depends upon the wise selection of models.

Criticism must take account of excellence as well as weakness. Errors must be treated in such way that the pupil will proceed intelligently to eliminate them in rewriting. As much as possible, the criticisms should be made in personal conference.

The materials selected for study as literature should represent the several types of literary art. The whole range of literature as to nations and periods of history should be represented. The selections must include materials suitable to the level of ability and the spiritual and social development of high school pupils.

The efficiency of class work will be greatly improved if the pupils are directed in a mode of attack which requires their critical activity. Their own analyses and syntheses and judgments as to value will prove of far greater worth than the teacher's lectures, or the compilation of opinions of the professional critics.

References

Baker, Franklin T., and Thorndike, Ashley H. "Teaching of English," The Macmillan Co., New York.

Bolenius, Emma M. "Teaching Literature in the Grammer

Grades and High School," Houghton Mifflin Co., Boston.

Bolenius, Emma M. "Teaching of Oral English," J. B. Lippincott Co., Philadelphia.

Carpenter, George R., Baker, Franklin T., and Scott, Fred N. "The Teaching of English in the Elementary and the Secondary School," Longmans, Green & Co., New York.

Chubb, Percival E. "The teaching of English in the Elementary and the Secondary School," The Macmillan Co., New York.

Hatfield, Walter W. "Business English Projects," The Macmillan Co., New York.

Herrick, Robert. "Methods of Teaching Rhetoric," Scott, Foresman & Co.

Hitchcock, A. M. "Problems in the Teaching of Composition," Allyn & Bacon.

Hitchcock, A. M. "How to Study Fiction," Allyn & Bacon.

Kretzmann, Paul E. "Teaching of English," Concordia Publishing House, St. Louis.

Lomer, Gerhard R. and Ashman, Margaret E. "Study and Practice of Writing English," Houghton Mifflin Co., Boston.

Marsh and Royster, "Teachers' Manual for the Study of English Classics," Scott, Foresman & Co.

Thomas, Charles S. "The Teaching of English in the Secondary School," Houghton Mifflin Co., Boston.

Thomas, Charles S. "How to Teach the English Classics," Houghton Mifflin Co., Boston.

Tomkinson, W. S. "Teaching of English," Oxford University Press, New York.

CHAPTER VI

THE TEACHING OF LATIN

The Greek language and literature have so generally disappeared from the high school curriculum that the present discussion will be confined to Latin as the sole representative of ancient languages. The suggestions as to values and methods here proposed will apply with slight modifications to the teaching of Greek.

Place in high school curriculum amply justified—Our analysis of educational values in the second chapter indicates that notwithstanding the present day popular disfavor with which Latin is regarded, the place which this study has held in the secondary curriculum in the past is amply justified. The practical utility of masterful English is unquestioned; nor can the value of the proper study of Latin as a means to the mastery of the vernacular be more successfully questioned. English is a fluid tongue, loose in construction, and not well defined as to the meaning of words. Latin is a well defined tongue as regards both sentence construction and word meanings. It offers precisely that species of training needed as a corrective of the looseness inherent in our own language. It makes for precision in use of words and proper regard for placing of words, phrases, and clauses in the construction of sentences. The critical study of any language, espe-

cially one of strict construction, through a period of several years develops that mental attitude, of inestimable value from the standpoint of logical thinking, which we call language consciousness. Ordinarily language consciousness passes over into language conscience. Another value of Latin which deserves increased consideration because of practical changes in the world grows out of the fact that the language of Ancient Rome is mother of the Romance languages as well as foster mother of English, and thus is the progenitor of the tongues that rule the earth. A mastery of Latin offers the most immediate approach to the modern tongues of most general usage. The disciplines derived from the proper study of a foreign language, particularly of Latin, are not secured so well from any other source. Evidently the body of culture made available by a knowledge of the language of the present allied nations has values which the modern citizen can ill afford to miss. We may confidently expect that the Latin language and literature will long continue to be a vital factor in public education. Latin cannot be truly a dead language as long as patriotic devotion to one's country, dignity of citizenship, and a lofty sense of duty are fundamental in national character.

Objectives in teaching Latin—In view of these possible values we may state the objectives in the teaching of Latin to be:

(1) The cultivation of language power, particularly the fullest command of English;

(2) The training of the pupil in analytic-synthetic processes of thinking;

(3) The understanding of the Roman people and the essential elements of their civilization;

(4) The acquisition of a body of knowledge, particularly of those concepts which constitute the contribution of the Roman people to modern civilization.

Latin studied for English values—In the secondary school the first and second of these objectives are of most consequence, both as regards their immediate value and their adaptability to the high school mind. It will give the Latin teacher the best possible attitude toward her subject to say that she is primarily an English teacher; that she is a teacher of English vocabulary, English grammar, and English composition; that her success as a teacher of Latin is to be measured primarily by her pupil's mastery of English. She labors for mastery of Latin not for its own sake but as a means of reaching indirectly the same results which the English teacher strives to obtain directly. This attitude will determine her mode of attack and also points of emphasis.

Method in Latin same as in English—In general, the method of Latin teaching is the method of the study of reading and literature in the English language. The mental process employed consists of:

(1) Getting the thought,

(2) Through the Latin language, involving

(a) The mastery of vocabulary and

(b) The mastery of grammar;

(3) Expression of the thought thus acquired in good English.

Compared with primary reading—This is the process employed by the primary pupil learning to read his

mother tongue and by the older student in his study of a literary classic. The pupil's mind is focused on getting the thought from the printed page and giving it out in his own tongue to his audience. His consideration of vocabulary and grammar is governed solely by their use as a means of correct interpretation of the content. The more thoroughly he has mastered the words employed and the grammatical functions before attacking the sentence the more readily and accurately will he grasp the content. Thus in reading Latin as in reading English it is necessary in facilitating the reading process to have such mastery of vocabulary and grammar that they will be pushed into the background of consciousness. Of these two, vocabulary mastery is the more essential for the reason that for the most part grammar is a matter of mental process and therefore is largely universal. It is the nature of the judgment process objectified in the sequence of the words composing the sentence. If the words are readily identified and interpreted, the mind will supply from its own nature most of the grammatical functions. The problem in Latin as in English, therefore, is largely reduced to the acquisition of an ample working vocabulary. Words are the tools of thought. Without them little can be accomplished. With them other difficulties shrink to small proportions. The weakness of Latin teaching centers at this point. The widespread use of "ponies" is evidence of the pupil's consciousness of this defect. It is not so much the sign of moral depravity as of psychological urgency. The easiest way to dispose of the interlinear is to make it unnecessary.

Motor reaction to reading matter—There is a third condition of efficient Latin interpretation which is almost universally disregarded. The fundamental fact of language is that it is a form of behavior which results from the stimulations of the existing situation, and which has been conventionalized for the purpose of communication. The word orginally was not "the sign of an idea," but rather the motor expression of the idea or of the sensation underlying the idea. When man discovered this uniformity of experience under given situations, he very readily adopted these motor responses as a means of making his experiences known to others. This principle applied to reading means that the content of language is apprehended in proportion as the reader makes the motor responses involved in the essential nature of words and constructions. It means that he must live again the experiences embodied in words and grammatical relations. The principle is very well stated in the old phrase "suiting action to words." The primary teacher fully appreciates the significance of this fact, and makes constant use of it in teaching the beginner. The same thing is true in the work of the dramatic artist. The same values attach to the teaching of Latin. The oral reading of the Latin text is worth while provided the pupil is led to give such reading its proper dramatic quality. He must sense the action lying back of and involved in the incident portrayed. He should "live" the word at least to the extent of the innervation of the muscles which would be employed in actual pantomime. Thus does he come to get the full value of word and sentence.

Learning the Latin word—The learning of the Latin word is a memory process. It involves the memorizing of the oral and printed forms of the word in association with the idea it represents. The English associate, of course, enters into the combination in the same way that it enters into the definition of a more difficult English word. It is important that so far as possible the association between the Latin word and the idea be made both direct and natural. Whatever mode of presentation is employed, the fixing of the word in memory requires frequent and vigorous repetition. Drill is as necessary in the Latin class as in the primary reading class. In fact the problem and the process are the same throughout. The principle source of vocabulary weakness in Latin is the lack of sufficient drill to fix the words in mind. Any device found profitable in the primary school will, with slight modification, be found profitable in the high school Latin class. Blackboard drill, word contests, and similar devices have been found effective. The "flash method" has proved particularly valuable, making it possible to *speed* up the drills, and requiring the closest attention of the pupils. It is not amiss to remind the teacher of Latin, as in English, that pronunciation and spelling must go along with the meanings of new words.

Connecting the Latin word with its English relatives—The study of the new Latin word should at all times involve the examination of English words proposed as equivalents to determine their relative fitness. This not only will facilitate the translation of Latin but will have a beneficial reaction on the English. A

considerable portion of the time should also be given to the English derivatives of Latin words. It will prove a valuable contribution to our own language to work out systematically the word families which have developed from the mother word in the Latin. The teacher should bear in mind our proposition that she is first of all an English teacher. She will thus endeavor to make the most of this opportunity for enrichment of the pupil's vernacular.

Professor Stout on elementary Latin—The following splendid discussion of the mastery of the vocabulary and forms of the Latin language by Professor S. E. Stout of Indiana University is quoted by permission, from Bulletin No. 35 of the Department of Public Instruction of Indiana: "The learning of forms is pure memory work, and should be practically mastered in the first year of study. There is little hope that pupils will find pleasure or much profit in going on to the study of the Latin authors until they have the forms pretty well mastered.

"Study and drill and constant review are the only methods that can be employed. But the enterprising teacher will find means to direct the study, and to secure the drill and review by methods that are varied to arouse interest and prevent monotony. Any device that will assist pupils in memorizing is good pedagogy in this phase of the work. There is no way to avoid the requirement of sustained effort on the part of the pupil to commit the forms to memory, and it must be resolutely insisted upon.

"But every method of making his efforts to acquire and retain and hold the forms at instant command

should be used. He should say sets of endings in a single breath; as, -us, -i, -um, -o, -orum, -is, -os, -is; and, -o or -m, -s -t, -mus, -tis, and -nt, spelling the last ending here for the sake of euphony. Much repetition must be secured, orally, on paper, at board. Individual forms, cases, numbers, persons, genders, degrees, etc., may be demanded for instant answers to rapid questions. Correction of written work in the forms may be assigned to pupils who are behind as a further drill for them. The conjugations should be taught by stems, personal endings, and connecting vowels. Such observations as that neuters are alike in the nominative and accusative should be given to relieve the strain on the memory. Matches such as the old fashioned spelling matches may be arranged for answering questions in forms. The paradigms at the back of the book should be used for frequent extensive reviews. The instant command of forms and the accompanying meaning can be won only as command of the multiplication table is acquired, by much rapid practice in saying them and writing them and using them.

"In its earliest stages it is largely a matter of memory, in its later stages its greatest demand is for judgment and discrimination. The vocabulary of the first and second years must of necessity be small because the other difficulties which confront the pupils in these two years are very great and cannot be postponed. All the forms and syntax can be taught the first year with a vocabulary of 500 to 800 words. It is not usually found practicable to extend this beyond 2,000 to 2,500 words in the second year. So long as word-

learning is mostly memory work, study and drill and constant review of the whole vocabulary previously taught must be systematically kept up. The methods and devices will be similar to those employed in the teaching of forms.

"The learning of words is greatly facilitated by teaching pupils from the first to analyze words into their component parts. Every month should enable pupils to know without consulting the dictionary the meaning of a larger proportion of the new words met. There is no reason why a pupil who has had a few months of Latin should go to the vocabulary to find the meaning of reduco, produco, deduco, adduco, etc.; and second year students should apprehend the meaning of such English words as eligible, dirigible, paucity, apprehend, amiable, sinecure, involved, contravene, deviate, apposite, without the use of the dictionary.

"A great number of words which are but dimly grasped and never comfortably used by students who know no Latin, and which constantly occur in daily newspaper, magazine, story and school textbook, should by the study of Latin be made easy for students to grasp and retain.

"A short time should be given in connection with every lesson to connecting the old and the new Latin words with English words. Pupils will constantly be delighted to discover the fine imagery that underlies so many of our common words, such as occur, define, insult, denude, resilient, insurrection, decadent, infant, repulse, defend, discuss, dismiss. The way will be opened for a fuller appreciation of all scientific and imaginative literature. The fact that such study must

of necessity start from the root meaning of the word and trace the logical steps by which it acquired new meanings brings the Latin teacher an opportunity such as no other teacher ever has to give his pupils that mastery over words which is an absolute condition of progress in any study which is pursued in large part by reading."

Process of translation—The process of translation of a passage in a foreign language to the vernacular is precisely the same as that of reading an English selection, with this difference; in reading the English, we get the content from the English language and hold it in mind giving it out in the same language form; in translation we get the thought from the foreign tongue and think it or express it in English. We substitute one set of symbols for another in translation, but we do this also in reading. The process is precisely the same as that involved in teaching an English selection employing words not found in the pupil's working vocabulary. Method of translation, therefore, and method of reading are one and the same.

First Year Latin

The grammatical method—A number of methods of teaching Elementary Latin have been proposed at different times and ardently championed. We shall briefly notice five of them. First, historically, is the Grammatical Method. This method approaches the subject by first learning the contents of the Latin grammar, that is, by storing the memory with declensions, conjugations, rules of syntax, etc. This is followed by

taking up the "Latin Reader," a compilation of easy Latin stories, in the translation of which the pupil acquires his vocabulary and is drilled ad libitum on the applications of the grammar previously learned. This is heroic treatment, and while it is no pleasure excursion for weaklings, it *"works"* as is demonstrated in the splendid classical scholarship of former generations. The grammatical method is entirely psychological for adult minds; and while it does not recommend itself for use with the younger pupils and those of mediocre ability, it will be found satisfactory with gifted pupils and those of mental maturity.

"Psychological" methods—In recent years the increasing attendance in secondary schools has made the student body less select, resulting in somewhat lowering the average mental ability of classes. This fact, together with the introduction of the elective principle, has compelled the Latin teacher to seek to make her subject more attractive and less difficult of study. Among the new methods devised which have proved to have merit are the Natural Method, the Psychological Method, the Inductive Method, and the Graded Exercise Method. Some of these have appeared under other names. The Natural Method is based on the principle of imitation and proposes that the pupil shall learn Latin in the same way that the little child learns his mother tongue, that is, he shall learn to speak first words and then phrases, and then short sentences. Subsequently he will take up reading in the same manner, learning the grammar as it becomes necessary later on. This method is effective but requires a long period of time. The Psychological Method is based on

the two principles of direct association of the word with the subject or action and of the unitary character of the sentence. It emphasizes an abundance of sensory experience. It is well adapted to young children but involves considerable duplication of experience in the older classes and consequent waste of time. The Inductive Method makes its approach by taking up a classic such as Cæsar's "Commentaries" and proceeding by exhaustive analysis of sentence by sentence to acquire Cæsar's vocabulary and the elements of grammar. This is heroic treatment also and has not commended itself generally, because of the monotonous drudgery involved as handled by the average teacher. Employed by an inspiring teacher of large scholarship it is an excellent method. The Graded Exercise Method, embodied in the best known First Year Latin books, is based upon the cumulative principle and the learning of vocabulary and grammar together, beginning with easy sentence exercises and proceeding to exercises of greater length and involving a larger number of words and more difficult elements of grammar. This method is favored by the majority of teachers and pupils, and if used with proper regard to the principles stated in the first half of this chapter, is entirely satisfactory. It is a combination of the other methods, incorporating the best features of all, and thus is as well adapted to the average class as any we may hope to obtain. Quoting again from Bulletin No. 35 of the Indiana Department of Public Instruction: "If time can be had at the first meeting of the class, the introductory lesson should be read with the class, and the

pupils should practice pronouncing the Latin words used as examples in these sections. Sections 1–8 should be learned by constant reference to them in the first weeks while pronunciation is being fixed. Students really learn their pronunciation from the teacher. A correct pronunciation adds greatly to the beauty of the language. It also introduces pupils in their first lesson to the most fundamental characteristic of the Roman people, the perfect reign of law among them. Be particularly careful to pronounce long vowels long in unaccented as well as in accented syllables, and to sound double consonants so that they will be heard twice distinctly. The proper time to fix in mind the correct pronunciation of a word correctly should be the first time it is met. A conscious effort to say the word correctly should be made at that time. If words are pronounced correctly, it will add little to the pupil's burden to mark all long vowels in written work. It is well to have this done if the teacher is master of a correct pronunciation. If he is not, marking the long vowels grows more and more tedious, and is unprofitable.

"From the beginning care should be taken not to allow any stiff and unnatural English to be used in translating from Latin into English. The sentence must first be thought through in the Latin way of expressing it, but if this is done aloud it must not be accepted as a translation into English. After the thought is thoroughly understood, it is then to be expressed exactly in our way of putting it. That is translation. Avoid the use of any one English word as an invariable translation for a Latin word.

'Laborat' may be 'is at work,' and should not always be 'labors'; 'videtur' sometimes means 'is seen'; the rather cumbrous 'fatherland' should not often be used to translate 'patria'; and 'agri' should not invariably be 'fields.' Supply the articles and possessive pronouns necessary in English idiom. Use the progressive or emphatic form of the English verb if the context requires it. Use our possessive case for the genitive if it makes better English. Use the infinitive in English to express purpose. Use the English indicative without a 'may, can, might, could, would, or should' to translate the Latin subjunctive in indirect questions, result, casual, temporal, and many other kinds of clauses. Render ablatives absolute in English idiom. Do not hesitate to change an active construction in Latin into a passive construction in English to preserve the correct emphasis, as is often necessary when the accusative stands first in the sentence. Let 'Galba agricola' sometimes become 'Farmer Galba' and not always remain 'Galba the farmer.' In translating connected discourse the translator must always be keenly aware of the requirements of the context in choosing the terms and the phrasing to be used in rendering the original.''

Study of the Classics

In the first part of the chapter it was stated that the teaching of Latin involved the same mental processes as the teaching of the reading and literature of the vernacular. The Graded Exercise Method suggested for the first year of Latin is an application to

that subject of the method employed in the teaching of reading, grammar, spelling and composition in the first six or seven grades of the elementary school. The method which secures the best values in the study of Latin Classics is an application of the plans outlined in the preceding chapter for the study of English Classics. The following suggestion for the treatment of a "chapter" of Cæsar illustrates the method and the applications of the principle which we have emphasized as fundamental:

Lesson Plan For a Chapter of Cæsar

1. What is the incident told in the chapter?
   (Corresponds to the "plot incident" in study of an English classic.)
   State the facts confirming opinion by citation of portion of text stating same.

2. Who is the principal character in the action? What does he wish to accomplish? Why does he? What means does he employ? Why? By whom or what and by what means is he opposed? Why the opposition? What elements of character are displayed by each of the actors? What do you think of these dispositions?
   Justify each answer by citations of text.
   Analyze constructions incidentally.

3. The setting of the Incident.
   A. When did this event occur? How much time did it occupy? Time of day, month, season, etc.
   B. Where did it occur? Kind of place?

C. What picture would an artist draw in order to tell this story?

4. What was the immediate outcome of the event? What effect did it have on the making of France? What effect has it had, if any, on us? What lesson if any, may we learn from it?

The foregoing plan assumes that the pupils have been prepared for the lesson by the previous mastery of the vocabulary. If the teacher has constantly required the mastery of every Latin word in the First Year Course and in the preceding chapters in Cæsar, it will be a simple task to select the new words in advance of the literary study of a chapter and have them out of the way. The pupils will be directed to go through the advanced selections and prepare a list of the unknown words with each of which they will proceed as follows:

1. Pronounce the word.
2. Spell it.
3. Discuss its meaning and determine the real English equivalent.
4. Prepare a list of and discuss English derivatives.
5. Drill until recognition is instant.

A very effective plan for the study of Cicero's "Orations" may be evolved by a combination of the above as a plan for studying the incidents with the plan suggested for study of the English Essay. In the study of Vergil the plan for narrative poetry may be adapted and used with the omission of the reading of the production as a whole. This exercise will necessarily and properly conclude the study.

Summary

The place of Latin in the high school curriculum is amply justified by experience and on the grounds of educational theory. The value of the proper study of Latin as a means to the mastery of the vernacular can not be successfully questioned.

In the secondary school the primary objectives in the study of Latin are: (1) the cultivation of language power, particularly the fullest command of English; (2) the training of the pupil in analytic-synthetic processes of thinking. The best attitude of the Latin teacher is to assume that she is primarily an English teacher: that she is a teacher of English vocabulary, English grammar, English composition.

In general the method in Latin is the same as in English. The mental process employed consists of (1) getting the thought (2) through the Latin language (involving mastery of vocabulary and grammar) and (3) expressing the thought thus acquired in good English. This is essentially the process employed by the primary pupil in learning to read his mother tongue and by the older student in his study of a literary classic.

A condition of efficient interpretation of Latin, almost universally disregarded, is the necessity of proper motor reaction to the matter read as a means to the fullest apprehension of the content. The oral reading of the passage with true dramatic quality is strongly urged.

The key to facility in any foreign language is the learning of its vocabulary. In-so-far as possible the learning of the Latin vocabulary should be natural, that is, the association between the word and the idea should be direct. The principal source of vocabulary weakness in Latin is the lack of sufficient drill to fix the words in mind.

A considerable portion of time should be given to questioning the relative fitness of English words proposed as equivalents of the Latin, and to the English derivatives from the Latin stock.

The particular method to be employed in First Year Latin should be selected with reference to the maturity of the students. Possibly the most practicable method is that known as the Graded Exercise Method, based on the cumulative principle.

It is recommended that in the study of Latin Classics the teacher follow in the main the plans outlined for the study of English Classics.

References

Bennett, Charles E., and Bristol, George P. "The "Teaching of Latin and Greek in the Secondary School," Longmans Green & Co., New York.

Game, Josiah B. "Teaching High-School Latin," University of Chicago Press.

Kelsey, Francis W. "Latin and Greek in American Education," The Macmillan Co., New York.

Kittson, Edward C. "Theory and Practice of Language Teaching," Oxford University Press, New York.

Palmer, Harold E. "Scientific Study and Teaching of Languages," World Book Co., Yonkers, N. Y.

PAXSON, SUSAN. "A Handbook for Latin Clubs," D. C. Heath & Co., New York.

"Report of the Committee of Ten on Secondary Education," American Book Co., New York.

"Report of the Committe of Twelve on Rural Schools," D. C. Heath & Co., New York.

WEST, ANDREW F. "High Schools and Classics," Princeton Univ. Press.

CHAPTER VII

MODERN LANGUAGE TEACHING

It is desirable that the young teacher, in the beginning of her preparation for the teaching of modern languages, get a clear conception of the reasons for her undertaking. Why should they be taught in the American high school, or in the college for that matter? Five values may be cited as affording sufficient reason to justify the expenditure of the time and money now devoted to instruction in modern foreign language.

Commercial, preparatory and socializing values—Least of all is the so-called commercial value. This is the utility supposed to be realized by persons who employ the foreign languages in trade and international intercourse. However, the percentage of modern language students who have occasion to employ their French, German or Spanish in business enterprise or in any other situation which requires communication in the foreign tongue is so exceedingly small that the commercial value may be dismissed from consideration. The second reason for French and German is the requirement of a fair reading knowledge of these languages in preparation for graduate and professional study in the universities. Third, modern language study has a certain peculiar socializing func-

tion. In the mastery of the language of a people one gets something of the "mind," or mental attitude, of the people. He acquires something of their national point of view and of their mental processes. This mental reaction of language study has great significance in the resulting broadening of the sympathies and the growth of toleration for national peculiarities. A species of spiritual kinship is fostered which on occasion may become a stronger bond than blood-kinship. "The English speaking boy or girl of the New World may consider a knowledge of the Spanish language from three viewpoints. It may have for him the commercial value, of which we hear so much; it may have the cultural value, so seldom championed; it may have for him the most important value of the three, the so-called 'political-social value'."[1] Mastery of the mother tongue makes one a member of his tribe or nation; mastery of foreign languages makes one a citizen of the world.

Development of personality—The fourth value is closely connected with the third. The study of foreign language, if it is thorough enough to secure facility in the use of the language, is attended by a very definite growth of personality. Education is a process not so much of creating power as of releasing it. The youth comes to the school with certain potential abilities, that is, he comes with his powers "bottled up," if we may employ such phrase, through want of the means of adequate expression, and through repression by self-consciousness. The school does two things for him: it supplies to him a body of fact which becomes

[1] Indiana Department of Public Instruction, Bulletin 35.

the raw material to be employed in self-expression, and it also provides him with the means of self-expression in the form of methods of thought and language. Increase of his language power enlarges the scope and facility of his thinking, thus freeing him from his most serious limitations. At the same time the mastery of language is accompanied by an increasing sense of personal worth, with a correlative freedom from self-consciousness and embarrassment. The individual is relieved of those emotional conditions which have suppressed his latent abilities. His mental gears seem to fall into mesh, and his mental machinery springs into normal action, realizing in full his potential power. Now, possibly the chief educational value of the study of foreign languages is the function of language mastery in liberalizing the mind, or releasing the potential energies of mind and soul. It is what the older pedagogists very properly called "giving the student spiritual freedom." This contribution of itself affords a sufficient reason for including foreign language in the course of study. It needs to be emphasized, however, that this value is wholly contingent upon such efficiency of instruction as will lead the pupil really to acquire the new tongue as a vehicle of thought and expression.

Cultural functions—The fifth value is also sometimes discussed under the head of cultural functions. It is clear that no other variety of study requires the same degree of controlled attention. Daily exercise of voluntary control of the mind through a term of years, holding it rigidly to a task which much of the time may have little or no appeal for the learner, faithfully

inhibiting the tendency to run off after scores of attractive interests, secures a degree of self-control almost Spartan—a species of self-mastery of the utmost value to the adult brain worker, and a kind of ability which many aspects of modern life tend to dissipate. The language teacher who succeeds in securing such steady and devoted application is performing a cardinal service in this one species of discipline, which warrants unstinted recognition. Again, the process of translation involves an exacting analysis and synthesis of sentence form and content. This variety of practice in daily exercise throughout a period of several years of foreign-language study results in the fixation of a valuable mental habit. This, of itself, is also quite worth the teacher's consideration. But of more significance than either of these disciplines is the increase of thinking ability secured through providing the mind with language sufficient in variety and extent to give adequate expression to the stream of ideas. The attention of the reader is again directed to the discussion of the relation of form to content in an earlier chapter. The principle there emphasized is that the idea cannot exist apart from the word with which the mind clothes it. The process of conception consists in the fusion of meaning and symbol into the mental product called concept. A concept is consciousness of a symbol plus the understanding of the meaning which it represents. The concept of electricity is the consciousness of the "something-or-other" whose real nature is to us unknown but which we call "electricity," and which we understand functions in certain ascertained ways.

The symbolical element in the concept may be any concrete image, but ordinarily is a word or phrase. The idea *thousand dollars* may be the image of a stack of coin, or of a stack of bank notes, or it may be the image of the written expression, "$1000," together with the consciousness of a more or less vague nature, that we mean something which will accomplish about so much in satisfying our wants. All thought above the simplest reactions to sense-perception involves the concept. That is, all thought above the simplest ideation is symbolical, and for the most part is possible only by means of language, which universally is the characteristically human symbol. In effect, this means that thought is limited to the scope and variety of language which one possesses, and that every enlargement of language power involves the enlargement and perfecting of thinking ability. This is a value of which little is heard in teachers' discussions of language teaching, yet from the standpoint of the psychologist it is the most important contribution of language instruction to education.

Teaching objectives—From these considerations it is clear that the primary objective in teaching a modern foreign language is precisely the same as that in teaching the colloquial speech; namely, facility in the use of the language as such. Thus, the object in learning French is the ability to read, write and speak French effectively. Facility in the use of a language involves five elements of ability; thinking in the language, hearing in the language, speaking it, reading it, writing it.

While the conditions which affect the method of

reaching the objective in English teaching differ from the conditions involved in teaching a foreign language, the objectives are the same. The differences of method are occasioned by differences of starting point, maturity of the learner, time allotment, apperceptive material, and other similar conditions, not by difference of objective. The aim of the English-speaking-reading-writing pupil who takes up German is to become able to hear, speak, read and write German in acquiring information and communicating his ideas, just as he has already learned to do by means of English. That is, the aim in teaching a foreign language is to make it "colloquial." The more frankly the school recognizes this as the real aim in modern foreign language instruction, the more certainly such instruction will be made effective. All of the practical, cultural and disciplinary values discussed in the preceding section will be realized in accomplishing this aim, and cannot be realized in any other manner. In brief, if a foreign language is not taught for the purpose here suggested, there seems to be really no good reason for teaching it at all.

It is suggested frequently that the acquisition of the literary content is a primary objective. This may be granted in case of advanced work, but obviously does not apply in the first two or three years of instruction, and scarcely at all in the high school. In fact, the accomplishment set out for the high school is necessary to undertaking anything of a definite character with foreign literature. At the most, the national literature and history are of secondary consideration in the elementary courses, although all read-

ing material should be drawn so far as possible from standard literature, just as in the making of school readers in English we have learned to draw the practice material from literary masterpieces.

The Learning Process

The steps involved in the learning of any language are two: first, learning the vocabulary; second, learning to form words into sentences, and to understand sentences addressed to the learner. A third step, subsequently taken, consists in acquiring those abilities which constitute the art of discourse. But this last step cannot be taken until a relatively high degree of mastery has been attained. We are, therefore, concerned in the high school with the first two steps: learning the vocabulary, and learning the grammar; mastering words, and then learning how to organize words into sentences which convey our meaning with certainty, and to grasp the meaning of such groups of words when so organized.

Vocabulary learning—The first step in time and importance is vocabulary learning. It is here that the battle of language mastery is won or lost. It is the word that is the bearer of the idea. Without the word there will ordinarily be no idea. A thought is a judgment, which in turn is a synthesis of concepts, asserting a degree of mutuality varying all the way from a slight similarity up to identity, or denying the existence of a common element. Sentence formation is identical in process. It is an orderly synthesis of words corresponding to the synthesis of ideas in the

judgment expressed. Language consists of words which may be combined in certain definite ways to form discourse. All depends, therefore, on the supply of words at command, and the facility with which they function in consciousness. An address, ordinarily, is "heard" with understanding if all its vocabulary is "working" in the mind of the hearer. Reading offers little difficulty to the pupil if "he knows the words." The teacher has observed that the chief weakness of foreign language pupils in translation or composition is the famine of "words." The sensible primary teacher understands that her problem in teaching young children to read is to put her pupils in possession of "the working vocabulary" in the shortest time. We pointed out in the chapter on Latin teaching that the problem of the teacher of Cæsar or Cicero is essentially the same as that in the primary teaching of reading. Words, words, words! "Words are the handles to ideas." They are the tools with which we hear, read, speak and write; and our skill in these processes is exactly proportionate to the copiousness and thoroughness of our vocabulary. Learning a language begins in the learning of its vocabulary, consists chiefly in learning its vocabulary, continues the learning of vocabulary, and is successful in proportion to the learning of its vocabulary.

The association-complex—To learn a word consists in *fixing in memory an association-complex* comprising: (1) the Idea; (2) the Heard word; (3) the Uttered word; (4) the Seen word; (5) the Written word. These five elements are necessary to the "working possession" of the word. They should be intro-

duced into the association as nearly simultaneously as possible, and should receive equal emphasis. The idea is at the center of the complex, and the four form elements are grouped around it. Each form element is related directly to the idea, and indirectly to the others through their mutual function as symbol of the idea. To this association-complex the English word may be added, but should be kept quite subordinate. If the idea has been brought into consciousness, it is unnecessary to introduce the English word. The only reason for injecting it into the lesson at all is to get the idea into consciousness as the center or core of the new association-complex. To be sure, it is desirable and essential to have an active association of the English word and the foreign word, but this will be taken care of automatically by the mind through the mutual relations of the two words to the idea. It is by all means better to protect the pupil from having the new association-complex interrupted by thrusting the English equivalent into view.

The incorporation of the "heard word" in the association-complex supplies the basis of the power to get the meaning of discourse addressed to the ear. In like manner the "uttered word" forms the basis of speech; the "seen word" the basis of reading; and the "written word" the basis of writing. Thus the four types of language activity are grounded in the nature of the association-complex. This means that all four of the form elements should be included in the complex. It is not, of course, possible in the language learning of the infant, but it is easily possible in the introduction to a secondary language.

It was advised above that the form elements in the association should be introduced as nearly simultaneously as possible, and that they should receive equal emphasis. It might, for greater accuracy, be added that the "heard" and "uttered" words have a little closer, a rather warmer relation to the idea. They seem to be a little nearer kin. This may be due to the fact that they appear earlier in their development, but, whatever the reason, there seems to be a real advantage in presenting the spoken word first. This fact indicates the advantage of basing the foreign-language work on oral exercises rather than written.

An association of ideas is formed by bringing the ideas together repeatedly in the same state of consciousness, until the corresponding pathway is firmly established in the brain. The strength of the association depends upon the degree of attention with which the initial presentation is received and the frequency of repetition of the experience. The formula of word-learning is, Idea + Heard word + Spoken word + Seen word + Written word, flashed into consciousness repeatedly under the white light of enthusiasm and undivided attention. The primary teacher endeavors to get her pupils to think "box," hear "box," say "box," see "box," and write "box" in the same moment of conscious experience, with the greatest enthusiasm and concentration of attention, and then to repeat this experience with vigor and such frequency that the association is permanently fixed as a habit of mind. This is precisely the process which the teacher of French must employ. She may use a slightly different mode of presentation, and

arouse the needed enthusiasm and attention in more grown-up fashion, but the mental process of association will be precisely the same. The psychology of the primary reading lesson and of the high school lesson in French are the same, the method of teaching must be the same, and the devices of the primary school may be carried over into the high school with decided advantage.

Repetition is the key to habit-formation. Drill is the secret of vocabulary mastery. The most serious weakness of secondary teachers of language is their failure to drill their pupils sufficiently on the new vocabulary. They may appreciate the extent of this shortcoming by comparing the number of repetitions of the newly acquired word which they require, with the number of repetitions which are required of the young child in learning a new word. The secondary student memorizes more rapidly, to be sure, and his memory is possibly more retentive, but this advantage does not by any means enable him to make the new French phrase permanently his own with a half dozen repetitions. The best language teachers are vigorous drill masters. Many of the drill devices of the primary school, especially color changes, dramatization, and the "flash card," may be employed in the high school class with great profit.

Another aspect of the psychology of language-learning is of vital significance to the teacher. The fundamental fact of language is that it is a mode of behavior which has become conventionalized for the purpose of communication, and that its meaning is

comprehended to the extent that the individual is stimulated to the same experience. This principle applies equally in learning the new word, and in reading or translating the sentence. The full value of the word is impressed on the mind of the pupil to the extent that he is led to reproduce the motor experience with which the word is charged. This is the ground of the advantage of giving a dramatic touch to the language lesson. If "action is suited to the word," if the imitative coloring of the word is brought out, its meaning will be richer and its retention more permanent. One of the greatest foreign language teachers based his method almost exclusively on this principle. His procedure was simple. He led his pupils in doing one thing after another, all saying in concert the thing they did as they did it. The boy opened the door, saying, "I opened the door." He threw the ball, saying, "I threw the ball." New words were written on the blackboard and in the notebooks at the end of the lesson. There was endless drill with as much variety in the performance as possible. Special attention was given to purity of pronunciation, and to spelling the written word. Brief instruction with reference to essential facts of grammar was given as needed. These were high school boys. At the end of twenty lessons, in one case, the pupils had a working vocabulary of five hundred words which they understood, read, spoke, and wrote freely and accurately, and a splendid enthusiasm for the new language for the reason, as explained by a member of the class, that they were "getting the new language into their

bones." Their progress and enthusiasm were due to the fact of basing the new vocabulary in an appropriate motor experience.

The same principle, also, obviously, applies to sentence-interpretation, and to the appreciation of formal discourse. A sentence is, in fact, a conventionalized bit of behavior, and its meaning is most fully conveyed as the corresponding motor experience is first stimulated. The child's comprehension and appreciation of what he reads depends upon the extent to which he participates in the motor experience, conventionalized in the sentences read. This is precisely as true in reading in a foreign tongue as in the native speech. Possibly the necessity is even greater because of the element of strangeness and remoteness in the foreign idiom. This means that the new word, the difficult phrase, or idiom, the involved sentence, are readily and truly revealed by having the pupil "act them out." It means also that the incident in Cæsar's "Commentaries" and the section of Cicero's oration against Cataline will assume "flesh and blood" reality if the pupil approaches them with the advantage of the appropriate motor experience.

The reader is referred again to the discussion of the psychology of appreciation in an early chapter, and reminded that enthusiasm for the lesson material of foreign-language lessons rests upon the same psychological basis.

The grammar—The second step in language learning is the mastery of its grammar. It is generally agreed that the best practice is to introduce the facts of grammar as they are needed in the progress of the

lessons, beginning with the most general facts and proceeding gradually toward the more specialized. With the younger pupils these facts and principles should be presented inductively, but with maturer students they may be presented dogmatically. Since the sentence is conventionalized behavior, each grammatical relation is a conventionalized bit of behavior, and is best comprehended if developed out of the underlying motor experience. This occurs naturally in the inductive approach, but may be done readily in connection with the dogmatic presentation. Modes, tenses, cases, numbers, persons, and adjective, adverbial, conjunctive and prepositional relations, involve certain movements with which they should be concretely associated, and all forms representing such relations should be learned with such background of motor experience.

Methods

A working method may be readily formulated from the foregoing discussion of teaching objectives and learning processes. Three methods are in vogue: the Natural, the Grammar or Translation Method, and the Eclectic, the latter combining features of both the Natural and Grammar methods, but leaning strongly toward the former. The principal difference between the first and second is in (1) the inductive progressive introduction, in the Natural Method, of the grammar as needed in the progress of the lessons, and (2) the subordination or omission of the English equivalent in the association-complex. The Grammar Method

attaches greater importance to the phonetic and grammatical system of the language, presenting it as a separate body of truth, from the application of which in exercises the pupil will acquire the necessary language habits. Another essential difference is that the Natural Method seeks to secure the direct association of the foreign word and the idea, without the mediation of the English word. It seeks to secure the reading of the foreign sentence without translation into the vernacular. The Grammar or Translation Method works for translation rather than reading. The difference is, essentially, in the relative prominence given to vocabulary mastery and learning of the grammar in the combination of the two elements of the learning process, and the prominence given to English.

The eclectic method—The Eclectic Method, as the term implies, draws features from both of the older methods, being governed as to emphasis by the conditions of maturity, natural ability, and previous schooling of the particular class of pupils. It seeks to draw from all sources, ways and means of conforming to and promoting the learning processes outlined in the preceding section in the most direct and effective manner. Among its several features the following are most prominent:

1. English is employed in the classroom as little as possible, being confined to the presentation of ideas which cannot be made clear in the foreign tongue because of the limited attainments of the pupils. The recitations are conducted in the foreign tongue.

2. Reading and composition employ the direct association of the idea and the foreign word so far as feasible. The pupil is permitted to resort to translation to and from English only when he is unable to make the direct association, or to clear up difficulties of interpretation.

3. Since facility in the use of the new tongue is the objective, and the oral word is much "warmer" than the printed word, conversation will be emphasized.

4. It is more profitable for the pupils to read a large amount of standard material, employing in class discussion the method of treatment proposed for the study of English classics, than to make an exhaustive critical study of a small amount of exercise material.

Summary

Of the many reasons proposed to justify the place of the modern foreign languages in the secondary program, their commercial value, which ordinarily is ranked first, has the smallest value. Nor do their preparatory values in relation to graduate study apply to any considerable number of students. The learning of the foreign tongue as the means of access to the foreign literature can be of no great concern in the secondary school.

The real justification, admitting certain elements of value in the directions above suggested, is twofold: (1) the broadening of the sympathies and development of toleration of national peculiarities—a species of

spiritual kinship making for world unity, which on occasion may become a stronger bond than blood-kinship; (2) the liberalizing of the mind or what the older pedagogists called "spiritual freedom."

The primary objective in teaching a modern foreign language is to give facility in the use of the language as such.

Two steps are involved in the learning process: (1) learning the vocabulary, (2) learning to form words into sentences, and to understand sentences addressed to the learner. Learning the "art of discourse" is a step which can not be taken until a relatively high degree of mastery of the language has been attained.

The battle in language learning is won or lost in the mastery of its vocabulary.

To learn a word consists in fixing in memory an association-complex comprising (1) the Idea, (2) the Heard word, (3) the Spoken word, (4) the Seen word, (5) the Written word, with the Idea at the center of the complex. The formula for word learning is, Idea + Heard word + Spoken word + Seen word + Written word, flashed into consciousness repeatedly, under the white light of enthusiasm and undivided attention.

A dramatic touch should be given to the language lesson by having the pupil reproduce the motor experience with which the word or the sentence is charged.

The grammar of the language should be introduced as needed in the progress of the lessons.

The "Eclectic Method" is recommended for the secondary pupil. It combines the following factors:

(1) the amount of English is reduced to the minimum, (2) direct association of the idea and the foreign word is made, (3) conversation is emphasized, (4) a large volume of material is read, employing the method of treatment proposed for the study of English classics.

References

Atkins, Henry G., and Hutton, H. L. "Teaching of Modern Languages in School and University," Longmans, Green & Co., New York.

Bahlsen, Leopold. "The Teaching of Modern Languages," Ginn & Co., Boston.

Berlitz, Maximilian D. "Method for Teaching Modern Languages," M. D. Berlitz, New York.

Brebner, Mary. "The Method of Teaching Modern Languages in Germany," G. P. Putnam's Sons, New York.

Breul, Karl H. "The Teaching of Modern Foreign Languages," G. P. Putnam's Sons, New York.

Handschin, Charles H. "Teaching of Modern Languages in the United States," U. S. Bureau of Education.

Jespersen, Otto. "How to Teach a Foreign Language," The Macmillan Co., New York.

Kittson, Edward C. "Theory and Practice of Language Teaching," Oxford University Press, New York.

Palmer, Harold E. "Scientific Study and Teaching of Languages," World Book Co., Yonkers, N. Y.

Sauveur, Lambert. "Introduction to the Teaching of Living Languages," William R. Jenkins Co., New York.

CHAPTER VIII

THE TEACHING OF HISTORY

The field of history—Bernheim defines history as "the science of the development of men in their activity as social beings." De Garmo has said, "Fundamentally, history is the story of man and all that favors or hinders his progress in well-being—the influences of his environment whether natural or human, that have affected him, the responses he has made to the stimuli of this environment, the institutions he has devised to fix and transmit his advances; in short, the whole account of his efforts, mishaps, failures, and successes as a social being." We may express the same conception by saying that history is the story of the development of civilization, of "how things have come to be." For the purpose of this discussion we may say that civilization is the system of knowledge, attitudes, skills and instrumentalities which constitute the means of satisfying the human wants. These are conventionally reduced to seven groups: The Biological, Economic, Intellectual, Social, Political, Ethical, and Æsthetic. The satisfaction of these wants may be considered as to volume, variety, and refinement, or development above the brute level. The growth of the volume of means of human satisfaction, the develop-

ment of new devices and agencies for securing satisfaction, and the general total uplift of man's activities above the primitive mode, constitute the subject matter of history.

Human progress three-dimensional—Since method in teaching history is so largely governed by the underlying conception of the nature of history, it is worth while to consider the foregoing conception a little further. As a biological creature, man requires food, shelter, clothing, health and wholesome propagation. The evidence at hand leads us to conclude that in the beginning he satisfied these needs in a very crude and inadequate fashion. Like other animals, he subsisted on wild articles of food, eaten as procured; he found shelter as the beasts of field and forest; he was clad in nature's garb, and his domestic relations were akin to those of the brute life about him. Little by little he learned to make use of additional articles of food, to store up the surplus for the "lean season," to domesticate animals and plants in order to secure ample supplies, to cook, and then to eat with the ceremonialism which insured increasing self-restraint, mutual consideration, and fellowship. The perfecting of processes of food production, of manufacture of new food materials into an increasing variety of convenient and attractive forms, of balancing the ration and of facilitating digestion, and of refining the accessories and art of eating, goes on continually. Thus there is a three-dimensional improvement going on in the matter of feeding the human race; increasing adequacy, variety, and refinement—all making for the production of a finer type of human life.

History considers all aspects of human life—The same improvement is traceable in the other biological factors of housing, clothing, sanitation, hygiene and propagation. In the same manner we may trace man's improvement in the processes of acquiring wealth. Industrial progress is a three-dimensional fact. The intellectual satisfactions have grown from the weird tales and witchcraft of the ancient to modern scholarship; educational agencies and processes have developed from the limited, monotonous and childish lore of the folk, transmitted in camp-fire tale and tribal ceremony, to highly organized systems of schools, libraries, forums, press, and multiform agencies, reaching all sorts and kinds of people, revealing the secret of all fields of truth, and ever developing new and marvelous skills. How far man has risen above and beyond his primitive forbears in his provision for education! The same upward, outward and onward movement is seen in his religious and ethical life; in his political life; in his system of agencies and practices for securing fellowship; and in his pleasure life. The business of the study of history is to see how the present life of man in all of these aspects has grown up out of its beginnings with his primitive ancestors.

Getting the true perspective—The rise of civilization has been irregular. First one and then another of these seven factors in human life has become predominant. At one time the outstanding advance has been economic; again it has been religious; again intellectual. Since these factors are interdependent, each modifying the others, it follows that in one period of history political change will become the determining

factor, influencing progress in the other departments of activity. At another period, the economic struggle will be the determining factor; at another, the religious advance will govern other social movements; at another, the æsthetic progress may be the overshadowing influence. The teacher must keep in mind this kaleidoscopic character of his story. He must avoid the frequent error of attempting to explain all human history in terms of economic struggle, or of class conflict, or of educational advance, or of faith, or any other one factor. Man is a seven-strand creature, and his history is a many-colored fabric, no one color of which may be supposed to give dominant tone to the scheme as a whole. Referring to the mistake of the student who endeavors to explain all human affairs with reference to a supposed single fundamental element, Dr. Butler says in his introduction to Johnson's "Teaching of History": "For more than a generation past there has been a strong and steadily growing tendency to interpret the facts of history as the successive sequences in a chain of economic causation. It has been stoutly held and taught that the actions of men and of nations are to be explained as the effects of purely economic causes. To accept this, however, as occupying anything more than a subordinate and a secondary place in the study of history, is to close one's eyes to the most obvious facts of human experience. No small part of the life of individuals and of nations is devoted to courses of action and to policies which are in direct conflict with men's obvious economic interests, but which are pursued because of belief in some principle, because of adherence to some

ideal, because of faith in something unseen and eternal. The scholarly and the true interpretation of history is to view it as the record of the social, the moral, and the intellectual education of man, with economic forces and laws playing a constant but a secondary part."

It is well also to utter a word of caution as to the error of attempting a purely idealistic interpretation of historical facts, or to the corresponding error of attempting a materialistic explanation. The current of human affairs is in one period determined by ideas and beliefs; at another period, or in another country, climatic conditions, topography, the supply of natural resources, and other physical causes may exert the larger influence. There are two kinds of forces at work on human society, personal and physical. At one time the personal forces are the most conspicuous; at another the physical; at another they work together. This variation must be observed by the student and his interpretation governed accordingly.

Portrays the whole of human life—The science of history comprehends in its scope the whole of man's social life, the whole round of his effort to relate himself to the conditions of life. Quoting from Bourne's "The Teaching of History and Civics": "From even these fragmentary notes of the growth of the idea of history it is easy to see that history, or historical writing, has varied in form and in motive and in characteristic interests from age to age, being profoundly affected by the contemporary state of civilization. It is also plain that at present history, if it be understood in no narrow sense, must comprehend those phases of human experience which one great thinker

after another has brought within its pale. It must remember the unity of mankind, although it is not expected to explore with such painstaking zeal the stagnant civilizations of the East, and though it may leave to anthropology or ethnography the life of the African or Australian savage."

Educational Values in History

In the analysis of educational values of high school studies in an earlier chapter it was claimed for history that it possesses high value as an instrumental study, particularly in relation to literature, economics and socialism. Literary interpretation is possible only in light of the circumstances and conditions under which the selection was produced. These contributing factors are portrayed in the history of the period. The political and economic sciences are dependent for data very largely upon the facts set forth in historical survey. Both literary criticism and interpretation, as well as political science, are grounded in historical scholarship. The same relation is involved in educational theory and moral science. To all of these branches of learning history offers a valuable introduction and is necessary as the chief source of data.

The conventional value of history, of course, is high. It is impossible to think of culture apart from that insight into relative merits which comes of historical scholarship. Its necessity to intelligent citizenship is equally great. In a democratic society the ballot presupposes not only a knowledge of problems to be solved and the solutions proposed, but also

the power of critical judgment which can be derived only from an understanding of the solutions previously attempted and their outcome. To vote intelligently upon a proposed policy with reference to the government of our insular possessions requires a knowledge of the colonial policies of other nations in the past together with their successes and failures. Exact knowledge of conditions is necessary in the effort of the common people to solve their own industrial, financial, educational and political problems. In all of these problems a wise ballot is possible only under the illumination of extensive historical knowledge. An active consciousness on the part of the American people of the social upheaval connected with great wars in the past, and of our own experience with army contractors and the profiteering class in the Civil War period might have prevented much extravagance in recent years. Human nature is fairly constant, and man's reaction to similar conditions is practically uniform through all time and everywhere. The curve of human conduct is reasonably calculable. A generally diffused knowledge of the social disintegration following the French Revolution might have saved the present generation from many of its mistakes. The history of civilization in southern Europe certainly throws sufficient light on the operation of the several social factors to afford guidance to-day in the coordination of the forces at work in modern society. History is a sort of mirror in which men to-day may see reflected the outcome of all current movements and social philosophies, if allowed to run their course. The same uniformity of human nature which leads

man to make the same reactions over and over also causes him to make the same mistakes again and again unless restrained by the lessons of past experience. The most valuable contribution which the school can make to citizenship is to develop the civic wisdom which results from a widely diffused and abundant knowledge of the past experience of nations.

When we turn to the cultural influences of history the case is even more apparent. The emotional experiences of the pupil awakened in him as he traces the struggle of his ancestors for the betterment of their lives, as he pictures again the price paid by his fathers and grandfathers for the blessings of liberty, a stable government, an ordered society; the thrill of pride which he must experience as he reviews the heroism of the nation's great soldiers, the courage of the pioneer, the vision of the statesman who established national institutions; the emotion with which he contemplates how greatly he is a personal debtor to the vast army of men and women who have gone before and given to him ready at hand the discoveries of science, the inventions of genius, the dreams of poets, the insight of artists, and the wealth of foresight and industry—this rich emotional experience as he lives over in imagination the life of the race which has borne the torch of civilization up to his day, has a spiritual value beyond computation. As he views the struggles of men of all times and places to secure those same things which we most desire, his sympathies are broadened; he grows tolerant of the differences which he sees are after all small when compared to the great unities of human life. A catholicity of spirit, a broad-

ening of his mental horizon, a spirit of tolerance and co-operation, are first fruits of these deeper, vitalized insights into the historical past. Such sentiment and liberalizing of mind make the individual a citizen of the world, sympathetically intelligent with social movements everywhere, a participant in all of those movements, and capable of regulating his own life in harmony with world conditions. Such an attitude of mind is fundamental in a democratic society. Chesterton says that the first principle of democracy is this: "The essential things in men are the things they hold in common, not the things they hold separately." This unifying of the individual through charity of mind, breadth of insight, toleration, and the spirit of co-operation with the whole human race, past and present, is the beginning of true democracy. Chesterton also challenges the frequently expressed fear that over-much study of the past is in some manner inimical to the growth of democracy. In his volume on "Orthodoxy" he says, "But there is one thing that I have never from my youth up been able to understand, where people got the idea that democracy was in some way opposed to tradition. It is obvious that tradition is only democracy extended through time. It is trusting to a consensus of common human voices rather than to some isolated or arbitrary record. The man who quoted some German historian against the tradition of the Catholic Church, for instance, is strictly appealing to aristocracy. He is appealing to the superiority of one expert against the awful authority of a mob. It is quite easy to see why a legend is treated and ought to be treated, more respectfully

than a book of history. The legend is generally made by the majority in the village who are sane. The book is generally written by the one man in the village who is mad. Those who urge against tradition, that men in the past were ignorant, may go and urge it at the Carlton Club, along with the statement that voters in the slums are ignorant. It will not do for us. If we attach great importance to the opinion of ordinary men in great unanimity when we are dealing with daily matters, there is no reason why we should disregard it when we are dealing with history or fable. Tradition may be defined as an extension of the franchise. Tradition means giving votes to the most of all classes, our ancestors. It is the democracy of the dead. Tradition refuses to submit to the small and arrogant oligarchy of those who merely happen to be walking about. All democrats object to men being disqualified by the accident of death. Democracy tells us not to neglect a good man's opinion, even if he is our groom; tradition asks us not to neglect a good man's opinion, even if he is our father."

German pedagogy has made much of the moral value of history, but with the thought of using it as an introduction to or in support of particular ethical theories. Such interpretation is very certain to do violence to historic fact and to lose the very end desired. History has exceedingly high moral worth if it is taught as Bourne advises, merely to unfold truthfully the whole of human life before the student. "History will have for the pupil, as for the citizen, its greatest moral value when it remains faithful to the comprehensive conception of its work which has

been gradually built up by those who from Herodotus to Ranke have spent their lives in its study, when it seeks to unfold before the growing imagination of the student human experience in its marvelous variety, political, intellectual, religious, social, and economic. It is such historical knowledge, as Bernheim points out, which will be the best support of public spirit against the attacks of a hollow selfishness which is pressing in on all sides for the mastery."

The study of history also offers a variety of discipline not secured in other subjects. Man is described as a rational historical animal. He reasons out his course of present and future action with reference to the successes and failures in both his personal past experience and the past experience of the race. The more efficiently he thinks out his conduct the higher his ethical development. The emphasis of causal relations in history-study not only affords the necessary body of data, but encourages the habit of rational forethought. This habit of mentally clearing the way for pending action by systematic consideration of the implications of pertinent experience is of inestimable value, logically and ethically. It at the same time provides the basis of scientific method and develops the quality of prudence, the essential element in wisdom. It was also pointed out in a preceding paragraph that a uniformity exists in human life as in physical nature. There is possible a science of human affairs. There is, therefore, possible a scientific method of thought with reference to historical data. The historical method is recognized in logic as a distinct form of inductive science. No other study in the curriculum

affords exercise of the mind in this particular process. However, historical science differs from the natural sciences in one other important particular, namely, the presence of a large contingent factor. This characteristic has been well pointed out by De Garmo in his "Principles of Secondary Education," the volume on "Studies," from which we quote at some length:

"History is pre-eminently the realm of the contingent, that is, of a class of causes and effects which, unlike those revealed by natural science, do not follow the invariable order of natural law, but are influenced and sometimes determined by circumstances that might have been otherwise. This does not mean that no law can be observed among these phenomena, for that would not be true. Yet these laws lack the apodictic certainty of those realms of science with which the will of man has nothing to do. For illustration, the result of a battle often depends not upon numbers and equipments alone, but upon accidents of field and flood, the unforeseen presence of natural obstacles, like the sunken road at Waterloo, the freshness or weariness of the troops, their food and ebb of courage, the genius, stupidity, jealousy, caprice, intelligence, or information of the officers. The mental attitude of a people is generally influenced if not determined by their economic situation; often by prejudices engendered by the quarrels, sometimes personal, of party leaders, and not seldom in the past by differences in religious opinions and practices, whereby men not unfrequently lost their natural reason. In short, historical results are a resultant of forces both natural and human, wherein the accidents of the one and the defects of the other play their part."

The study of history also affords exercise of the reconstructive imagination, a mental function of large

practical significance, and is of equal value with the natural sciences in cultivating the power of logical memory.

Objectives

Applying the foregoing discussion of values, the teacher of history will set up three objectives:

1. To secure that acquaintance with the origin of the elements of society which will enable the student to understand the world of human activities. This is the primary object, the acquisition of the largest possible body of knowledge of historical fact.

2. The development of insight into the significance of this body of fact as revealing historical tendencies, and the development of skill in tracing causal connections between past events and between past experience and future situations.

3. The cultivation of certain attitudes which go to determine the individual's social disposition, or to constitute what is called good citizenship. Prominent among these attitudes are a broad sympathy with all classes of people; a spirit of toleration as to differences of dogma, parties and sects; a spirit of cooperation; good will—the disposition to wish everyone well; and a sense of personal obligation to repay to society in kind the service received. This sense of obligation is awakened by revealing to the pupil the cost in labor, privation, and suffering of the privileges which he enjoys; by helping him to see that the toil of the pioneer, the sacrifices of the soldier, the thrift and industry of ancestors, constitute the major

part of the price paid to secure to him the advantages which he enjoys as a member of modern society. This contribution is as valuable to him as if made solely for his benefit. This makes him in debt, and since he cannot repay those who have served him, he can satisfy his obligation only by passing on his heritage unimpaired and increased to the next generation. The school can accomplish nothing more valuable to society than to implant in the heart of the individual the realization that he is the channel through which the achievements of civilization are handed on to the future, and the feeling that the obligation thus imposed on him cannot in honor be lightly treated.

The Learning Process

The method of teaching history is governed by the learning process involved in the study of history, and in historical research. The student passes through three successive steps. The first is:

(1) The acquisition of a body of fact. This is accomplished by:

(a) Discovery of an outstanding fact or group of facts, definitely ascertained either by personal observation or from competent authority;

(b) Conceiving the situation which must have existed in order to make this ascertained fact or group of facts possible.

(2) The second step is the interpretation of the situation thus ascertained as to:

(a) The causes which led up to it, and

(b) The consequences which have followed.

(3) The third step in the process is the application of the information thus acquired to the explanation of other situations under study, and to present social situations.

Method of historical research—The process of historical research, which is essentially the process of the student of history, may be illustrated by observation of the methods of the archeologist. The workmen digging in an ancient ruin unearth a bit of wall, a fragment of marble, a bit of statuary, some fragments of pottery. This collection of material becomes what the logician calls a "monument," an accepted group of facts from which to determine other facts which must exist or have existed in connection with those discovered. From this monument the explorers proceed to think out the original situation of which these uncovered relics evidently were a part. In this manner they conclude that they are digging on the site of an ancient temple. Little by little, by means of inference from the material in hand, and employing the reconstructive imagination, they restore in mind the original structure with its interior arrangements, its furnishings, decorations and possibly the ceremonies which were performed at its altars. From these they may go on to an understanding, in part at least, of the religious and philosophic conceptions of the people, and thus to rather full information with regard to a body of fact which at first did not appear. This is the method of the trained detective. Given a scant clue he uncovers the entire story of the crime and locates the perpetrator by conceiving, by means of inductive reasoning and

reconstructive imagination, the situation which must have existed congruent with the known facts.

The writer of history does not stop with the discovery and record of such situations. He conceives of human life as a continuous stream made up of the main current and certain minor or secondary currents and eddies. He re-examines the data acquired and endeavors to select that which has significance as showing the drift of human life. He turns the light of his selected knowledge upon other accepted facts; he traces out causal relations, and endeavors to locate the real sequence of events.

Illustration from American history—Taking an illustration from American history, in the study of the Missouri Compromise the first step is to ascertain the nature of its provisions from the reading of a reprint of the document or from authentic résumés of its contents. The second step is to see from the nature of its provisions, as well as from the accounts of the passage of the measure, what the situation surrounding this action was at Washington and in the country at large. With this situation clearly conceived, the student is then prepared to investigate: first, the causes leading up to this situation and to the compromise of issues; and, secondly, the political, economic and social consequences which developed from the measure. With these causal connections traced out, the student then is prepared to turn the light of his new knowledge upon former legislation to test its wisdom, and upon the expediency of compromise measures in the settlement of issues upon which the opinion of classes and sections is sharply divided.

Treatment of current history—Topics in current history will be similarly treated. If the federal administration of the railroads during the war is under consideration, the first step, obviously, is to ascertain from available sources precisely what the government did. The second step is to work out a conception, among other factors, of the conditions of traffic, of railway finance, the exigencies of the war, the attitude of labor, the disposition of the people, the current economic theories, which constituted the situation forced upon our country in the matter of rail transportation. With this conception developed, the student will then direct his attention to the various economic, political and psychological causes which created this situation and which compelled the government to undertake this burden. The fourth step is the consideration of the consequences, economic and political, which have followed this measure. The study would end with the comparison of our experience in governmental administration of the railroads with our experience in the governmental management of other utilities and with the experience of other nations in state administration of industrial activities. The topic offers splendid opportunity for application to many current questions and to questions of the functions of government, the relative spheres of private and public interest in industrial undertakings, and of the relative efficiency and ethical level of governmental and private enterprise, all of which should be completely worked out.

Method in the high school—Now the teaching of history in the high school must employ this same proc-

ess: (1) acquisition of the body of fact belonging to the topic or period assigned; (2) tracing out the causal relations with what preceded and followed; (3) application to the further illumination of former studies and to problems now before the people. Necessarily the high school pupil is limited to the use of his textbooks, manual, and reference materials for his facts. He must accept his data on authority. But good teaching will make certain that he clearly and definitely understands what are the facts in the case and that he has these firmly fixed in mind as to action, time, and place. This is the basic element in the lesson. This part of the task is the main feature of the student's work in preparation, and must be well done; otherwise the remainder of the lesson will have small value. By means of well-chosen questions given in the assignment, the student may be led to such reflection on the facts learned and such examination of the authorities available as to think out the concrete situation involving the facts under study. The subsequent steps in the process, tracing out the reasons why these things happened, when and where they happened, and their significance for us, are for the most part properly the work of the teacher in the recitation. To put the matter in a formal manner:

I. The lesson assignment will comprise:
   1. The mastery of the information given in the text and other study-materials with reference to the topics designated.
   2. Study of questions formulated with the purpose to direct the pupil's mind along such

lines of inference as will lead him to conceive the situation as fully as possible.

II. The recitation will comprise:
   1. An exacting quiz of the class to insure that the pupils have properly mastered the matter assigned, and further questioning to develop the concept of the situation.
   2. Interpretation by the teacher of the causal relations and significance of the event, individual, or period, in the total life of man.

In the "Editor's Introduction" to Johnson's "Teaching of History," Dr. Nicholas Murray Butler has cogently outlined this method in a single paragraph which deserves to be held constantly before the mind of the teacher: "One of the wisest and most successful teachers of history that ever lived in America, Professor Francis Lieber of Columbia College, used a method peculiarly his own, and achieved exceptional results by so doing. In his college classes he assigned as the task for each exercise a definite number of pages in a popular manual of the history of Europe that was translated from the German. This manual was nothing more than a compact and dessicated collection of facts, including dates, names, and important events. Each pupil was required to master the contents of the assigned number of pages. When the class met, the teacher required a selected pupil, in the presence of his classmates, to write upon the blackboard a summary of the events that happened in Great Britain, for example, during the period under examination. By a system of cross-questioning the aid of the entire

class was had in securing the correctness of this summary. Then another pupil would be summoned to do the same thing for France, another for Germany, another for Italy, and so on until all of the material included in the assigned portion of the textbook had been covered. Then the teacher, turning with a triumphant look to his class, was in the habit of saying: 'Now you know what was happening in each of the great countries of Europe at a specified time. But why were those things happening? You do not know. You will not find out from your textbook, but I will tell you.' Then the eloquent and learned scholar poured forth a wealth of illuminating philosophical explanation that made the carefully memorized facts forever real in the minds of his fortunate pupils. There is no better way to study or to teach history than that. The fundamental data, the dates, the names, the bare events, must be learned by the pupil, and having been learned they must be interpreted."

Learning of dates and places—In order to trace causal relationships, it is necessary that events shall be definitely fixed as to time and place. No systematic organization of historical material is possible without determining the sequence of movements. Without doubt much of the haziness of pupils as to the nature of historical facts is due to the failure of their teachers to require them to fix definite boundaries of history. The learning of the time of a happening and its definite location gives a mental anchorage for the fact without which it floats about in the mind as an estray. That is, the learning of dates and location in the

study of history is in a very significant sense a psychological necessity as well as a logical convenience. The question of whether or not pupils shall be held for such mastery is not a matter of discretion on the part of the teacher. It may be accepted as a broad principle that a historical fact that is not so located can neither be truly conceived nor logically utilized. The significance of such a fact is wholly relative to its sequence in time and place. This does not mean that every possible date shall be learned, or that the study of history consists primarily in learning dates, but it does mean that the principal dates shall be learned, in fact, that the date of every event which is deemed of sufficient importance to master shall be learned, and to that extent the study of history does consist in learning dates. One of the writers of this book was deeply impressed with the futility of the current disregard of this element in history teaching while giving a course in War Aims to the young men in a Students Army Training Corps. These young men came from a large number of representative high schools, and were all high school graduates and some had as much as three years of college training. Yet the effort to trace with them the various movements and conditions leading up to the allignment of the nations of Europe in the Great War was entirely impossible until the program was suspended and the class taken back for several weeks' drill on dates and locations. With this accomplished it was a fairly simple matter to grasp the relationships which at first were beyond reach.

Other geographical data—In addition to learning the location of events the pupil must also understand

the other geographical features of the situation. It was observed in a former paragraph that historical causes are of two kinds: personal and physical. The physical causes are topography, climatic conditions, the character, extent and location of natural resources, character and location of markets, and all other physical features which go to affect economic conditions and the temperament of the people. When the student understands the location and character of coal, iron and oil deposits in Europe, the extent and location of grain-producing regions, the location of fisheries, of the cotton and rubber belt in Africa, the location of natural harbors, mountain passes, navigable rivers, and natural routes for railroads, the issues and allignment in the Great War readily become intelligible. Wars frequently develop into a struggle for ideals, but ordinarily they begin in competition for those economic and political advantages which are determined wholly by geographic conditions, and are to be thus explained. Certainly in the adjustment of peace terms geography is the primary determining factor. Revolutions and other internal changes usually rest upon spiritual conditions; international relations are quite as generally grounded in geographic conditions. The student is referred to Semple's admirable little volume on "Geographic Influences in American History" for a pertinent suggestion as to this phase of the study of all history. On the side of the personal factor in the growth of nations it should be observed that racial and national characteristics have large influence. Hence, national traits should also receive rather definite attention in considering the geographic aspects of

the subject. Experience reveals that high school pupils are naturally interested in the physical factors in human life and in the larger spiritual factors, rather more than in the political and dynastic issues involved. This suggests obviously that the high school course is the period in which this phase of historical study may be most advantageously mastered.

Relating history to the personal experience of pupils—Possibly the greatest difficulty to overcome in the high school work in history is the unrelatedness of much of the subject to the personal experience of the pupils. This makes it necessary for the teacher to provide the experience which is lacking, by the introduction of the largest amount possible of concrete material. A large number of personal contacts should be given through utilizing the connections of acquaintances with the places and events involved. In most classes there will be pupils who have descended from families who were engaged in the outstanding movements of modern European history; Huguenots, emigrants from Germany in 1849, refugees from Russia, soldiers in the Franco-Prussian War. A review of the experiences of such families will give an element of "human interest" to these topics. For the same reason much should be made of biography. The pupil of any age is instinctively interested in persons. High school pupils particularly are romantic and strongly attracted to the outstanding personalities of all times. A clever teacher may readily utilize this interest as the approach to the movements of a period. There is the additional reason for emphasis on biography in the fact that the life of a nation is quite largely an

expression of the thought and will of its few outstanding individuals. These personalities think and decide for the masses of the people. An understanding of the leaders lets the pupil into the clearest conception of the period. In a way, also, the leader is a reflection of the spiritual life and the national purposes of his people. Thus, again, the study of biography is a direct approach to the significant facts of the people or the period. Martin Luther explains German Protestantism for the reason that he both reflects the tendencies of the German people of that period and gave character and direction to those tendencies. Abraham Lincoln, Henry Clay, and John Calhoun in the same manner explain the American Civil war. Cromwell, Disraeli, Gladstone, Napoleon and Bismarck explain their times and movements. It is scarcely possible to over-emphasize the biographical elements.

Making instruction concrete—For concreteness the teacher must depend largely upon "source material"; antiques, diaries, correspondence, reprints of original documents, and other published matter of the period under study. As much of such material as is available should be placed in the hands of the pupils. They should be required to have a personal acquaintance with all such documents as the theses of Luther, the Magna Charta, the Treaty of 1815, the Franco-Prussian Treaty, the Articles of Confederation, the Missouri Compromise. Some very successful teachers have found excellent source-material in pictures having a historical content. It is quite possible through collections of prints and clippings, put into orderly

arrangement, to tell the story of civilization rather completely in a form which appeals to the eye. The most valuable accessory of the history teacher is the abundant supply of literature covering the important periods. Narrative poetry and fiction are especially valuable in this connection. The function of this material is not to displace the textual material—the scientific treatment of the subject—but to give the facts thus acquired that romantic value which the mind craves. Just as the books of Ruth and Esther in the Bible let the reader into the spirit of ancient Israel, so the "Æneid," the "Odyssey," "Paradise Lost," "The Knights of the Round Table," Scott's novels, and the less classic fiction of the modern writers give flesh and blood to the story of human life. Such material is immensely valuable in assisting the student to sense the situations of historic events, and in the interpretative process of his studies. Any bias of mind which may be involved is more than evened up by the fact that the pupil acquires a definite point of view and a large concrete element in his conception of the subject.

Use of reference material—It is very important that the pupil become acquainted with at least a few authorities on each epoch, not only to give a trustworthy fund of fact, but also as a mental discipline and to secure the peculiar solidity of scholarship which comes of a substantial mental background. The school library may easily afford the small number of such books needed to cover the entire course, and familiarity with their contents will give a first-hand quality of student-

ship which insures active interest as well as definiteness of mastery.

Developing the critical attitude—An effort should be made to develop a critical attitude in the student. This may be accomplished in part through class discussion of questions on which there may reasonably be differences of opinion, and in part through the study of the critical judgment of authorities. The essential thing is to stimulate a personal reaction of the pupil to the questions at issue. The training of the critical habit of mind is necessary if the study of history is to have the prudential value claimed for it in the first part of this chapter. Before completing the secondary course, the pupil should acquire a rather definite standard of judgment to evaluate the movements and events under study. The development of such standard is one of the chief functions of the teacher. The habit of critical judgment, like all other habits, can be developed through constant practice. The making of note-books and the writing of papers are helpful if made to contain the pupil's own findings and conclusions. There is not much value in filling them with material copied from source books. As stated above, the real value comes from the personal reaction of the pupil.

Suggestive lesson plans—But a word is needed as to the class exercise. The assignment should be definite as to topics, and with younger pupils should give definite reference to sources. The recitation should be devoted to rigid drill on the assignment, followed by the presentation of supplementary matter by the

teacher, by his elucidation of the significance of the facts, and by an abundance of class debate on questions developed in the teacher's discussion. In order to secure the largest economy of time and labor, it is necessary to provide for supervised study in history, whatever the plan followed in the school. The results of such factors as library work, note-making, search for authority, can have little value except as the pupils are trained in the method of such work. The following is suggested as a plan for a lesson on

The ratification of the Constitution of the United States

I. Assignment.
   1. The provision made in the Constitution as to method and conditions of ratification.
   2. The campaign made in behalf of ratification. The arguments advanced; by whom, and how.
   3. The opposition; nature and source of opposition. Efforts made to defeat opposition.
   4. The action of the several states.
   5. The amendments agreed to in the adjustment of the differences between those who favored ratification and those in opposition.
   6. The industrial and political factors in the case; the political theories active in the issue.
   7. The statements of the available authorities with reference to the foregoing topics.
   8. Introduce the collateral readings which will throw light on the period.

II. The Recitation.
   1. Quiz over the ground covered in the assignment

to assure that the pupils have faithfully mastered the facts, and to fix them definitely in mind.

2. Presentation of supplementary information by the teacher.
3. Explanation of the issues involved and of the consequences contingent upon ratification.
4. Pointing out political issues and allignments which resulted from the discussions and action of the states, and which became issues in subsequent years.
5. Raising of questions as to the merit of the arguments for and against the new constitution. Stimulate class discussion of these questions, encouraging pupils to fortify their positions by recourse to the authorities.
6. Have pupils write report of their findings as to facts and issues, and as to conclusions with reference to the questions under discussion. The notes may very well contain a bibliography of the subject with specific citations.

Summary

History is the account of the development of civilization, considered as the system of knowledge, attitudes, skills and instrumentalities which constitute the means of satisfying human wants. The growth of the means of human satisfactions, in volume, variety, and refinement, and the general uplift of man's activities above the primitive mode, constitute the subject-matter of history.

It is imperative that the teacher have a true per-

spective of his subject. He must consider all aspects of life. The rise of civilization is irregular. First one and then another of the seven factors in human life has been dominant. It is a mistake to attempt to explain all history in terms of economic struggle, or of class conflict, or of educational advance, or of any other one factor.

It is also an error to attempt a purely idealistic interpretation of historical facts, or, on the other hand, to attempt a purely materialistic explanation. In one situation spiritual forces are dominant, in another physical causes exert the larger influence, and at another time they work together.

The objectives in the study of history are: (1) the acquisition of a body of knowledge of historical fact, (2) the development of insight into social tendencies, (3) the development of the socialized disposition.

The learning process in history is the same as the process in historical research.

The essential steps in the teaching process are: (1) mastery of the body of fact belonging to the topic or period assigned, (2) tracing the causal relation with what precedes and what follows, (3) application to the further illumination of former studies and to problems now before the people.

The study of a period, movement or institution should be pushed through to a clear insight into its social implications. It should terminate in the illumination of the learner's own life.

It is necessary in the effective presentation of much of history to provide the learner with an experience needed for an understanding of the topic under study,

by means of concreteness of presentation, but especially by the use of the literature and art of the period.

References

ALLEN, J. W. "The Place of History in Education," D. Appleton & Co., New York.

BARNES, MRS. MARY D. "Studies in Historical Method," D. C. Heath & Co., New York.

BOURNE, HENRY E. "The Teaching of History and Civics," Longmans, Green & Co., New York.

Committee of Seven. "Study of History in the Schools," The Macmillan Co., New York.

Committee of Five. "Study of History in Secondary Schools," The Macmillan Co., New York.

DE GARMO, CHARLES. "Principles of Secondary Education," The Macmillan Co., New York.

FREEMAN, EDWARD A. "Methods of Historical Study," The Macmillan Co., New York.

HALL, GRANVILLE S. "Methods of Teaching History," D. C. Heath & Co., New York.

HARTWELL, ERNEST C. "The Teaching of History," Houghton Mifflin Co., Boston.

HINSDALE, BURKE A. "How to Study and Teach History," D. Appleton & Co., New York.

JOHNSON, HENRY. "The Teaching of History in Elementary and Secondary Schools," The Macmillan Co., New York.

JOHNSTON, CHARLES H. "High School Education, Charles Scribner's Sons, New York.

KEATINGE, MAURICE W. "Studies in the Teaching of History," The Macmillan Co., New York.

MACE, WILLIAM H. "Method in History," Ginn & Co., Boston.

"Report of the Committee of Ten on Secondary Education," American Book Co., New York.

Robinson, James H. "The New History," The Macmillan Co., New York.

Brigham, A. P. "Geographic Influences in American History," Ginn & Co., Boston.

Tryon, Rolla M. "Teaching of History in Junior and Senior High Schools," Ginn & Co., Boston.

Wayland, John W. "How to Teach American History," The Macmillan Co., New York.

Williams, Laurence F. R. "Four Lectures on the Handling of Historical Material," Longmans, Green & Co., New York.

CHAPTER IX

TEACHING CIVICS

The teaching of civics aims at certain practical results as distinguished from scientific ends. The subject is therefore technical rather than academic. The object is training for good citizenship. As formerly conceived the spirit was rather academic than otherwise, and hence very properly the study could be merged into the course in history. But with the more recent emphasis on efficiency for right things in citizenship, resting upon a proper emotional experience and participation in wholesome civic activities, the subject has come to require a place of its own in the curriculum. The values sought are social and moral. The objectives are three:

(1) The acquisition of a knowledge of the agencies, processes and principles of citizenship, and the conception of a standard of judgment for determining the civic worth of men and measures.

(2) The development of those activities and dispositions which motivate good citizenship, including the spirit of Good Will, and the Socialized Conscience.

(3) The development of skill in the processes of citizenship, particularly in those local functions which constitute so large a part of the duties of the citizen and whose performance is so large a measure of civic virtue.

Knowledge of local institutions—Obviously a knowledge of governmental agencies is necessary as a proper basis for civic training. This body of knowledge must comprise an understanding of the machinery of local government: (1) the police system, (2) the water system, (3) the agencies for safeguarding health, (4) for fire protection, (5) for public improvements, (6) for storage and distribution of food and fuel, (7) the educational system, (8) the provision for recreation, (9) the street railway system, (10) the system of municipal finance. These studies constitute the first division of our subject, both logically and psychologically—logically, for the reason that all higher orders of administration have grown out of the relinquishment of powers by the community authorities; psychologically, because citizens grow into the higher and broader levels of civic worth through fidelity to local responsibilities, and because loyalty to state and nation is rooted and nurtured in loyalty to the home neighborhood. Much of poor citizenship is rooted in the people's ignorance of their local institutions and of the possibilities of these for use and abuse. Right impulses they must have, of course, but these impulses must be guided by an adequate intelligence as to the local functions which must be performed and as to the provision made for their performance.

What study of local government should include—The study of local government must include: (1) a conception of the several needs of the community to be satisfied; (2) the kind of persons charged with the several responsibilities thus arising out of these com-

munity needs, the qualification which such persons are supposed to possess, the mode of their selection, the powers conferred upon them, the facilities given them for doing the work with which they are charged; (3) the consequences of good and bad service; (4) a conception of what constitutes efficiency in each line of service. The study should result in the pupils' knowing definitely what constitutes good service, how to secure officials who will render good service, and how to get rid of the inefficient and vicious. The majority of people are well-disposed, and with the intelligence such an investigation would give, they will certainly become dynamic in the community life.

Class surveys—Class surveys of community conditions have been shown by extensive experimentation to be possibly the most effective method of securing the species of intelligence described in the preceding paragraph. An investigation of the infant mortality of the community, going into its relation to the social welfare, and tracing its causes back to unintelligent care on the one hand and the quality of the milk supply on the other, will open up the problems of education and sanitation in a manner which arouses purposeful interest and definite plans for betterment. A study of epidemics will lead to the same positive reaction. A survey of street construction and repairs, of illiteracy, pauperism, crime, the street railway service, of the burden of local taxation, and similar problems, which like the proverbial poor are live issues in every community, will lead straight to the information as to needs, agencies, and conditions, which is the necessary foundation for intelligent and

effective citizenship. Under wise direction such researches are easily within the range of the ability and interest of high school pupils, and experience has demonstrated the value of this approach to the field of community civics.

The emphasis of the new civics—The older civics placed the stress on office-holding; the new civics will place the emphasis on voting, the gravest responsibility of the American citizen. Under this new emphasis the school will strive to teach the pupil how to vote in the primary, and in the regular elections; for whom he should vote; how his vote is counted and reported; the consequence of intelligent voting, and of failure to vote; it will seek to develop the conception that the elector is the sovereign and the candidate an applicant for service in his employ, and make real the meaning of the phrase "the sovereignty of the citizen." The school will also endeavor to make clear the possible abuses of our electoral system and the heinousness of such crime against the people.

Passing from the community to the state—The second division of the subject deals with the state. In passing from the local community to the commonwealth the teacher should develop further the conception of representative government to which the pupil was introduced in his study of local elections. He should conceive of the state constitution as a compact entered into by all of the people of the state whereby certain powers and functions are relinquished by the communities and delegated to a body of officials selected for the purpose. The provisions of this compact should be mastered, the division of responsibility be-

tween local and state officials clearly defined, and the machinery of the state government surveyed. Again, the best approach to this information is through a study of the needs of the people to be satisfied by state functions, the agencies provided for each, the qualifications of officials necessary to efficiency, what constitutes efficient performance, and the consequences to the people of good and bad service. In these studies the case and survey methods may be employed advantageously. The former, perhaps, is more often available. The case of a person indicted for crime may be followed through the courts to the state's prison, tracing the constitution and authority of the trial court, the appellate courts, the origin and provisions of the law under which the action is taken, the administration of the prison, the function of the Board, the power of the Governor, the efforts at reclamation. The case of an insane person or a defective, highway improvement, the licensing of physicians, the state school system, the safeguarding of titles to property, the settlement of estates of deceased persons, and similar problems coming under the personal observation of the pupil, will afford such concrete approach to the functions and agencies of the state government as will surely give an intelligent appreciation and a proper foundation for personal judgment.

Passing from state to federal government—In the same manner the class may pass from the state to the federal government, making the approach through the conception of a compact entered into by all of the people of the nation creating a new body of public

officials whose field of operation extends to the whole country, and to whom are committed certain functions and responsibilities of which the state and local officials have been relieved. Here again, the truest conception of organization and functions will be secured by proceeding to a definition of the needs of the people to be satisfied by the federal government, the agencies created to perform such service, the qualifications needed in the persons selected for these duties, what constitutes efficient service and the consequences to the people of good and bad service. The case method may also be employed in these studies. Beginning with the postal service, the regulation of the currency in the pockets of the pupils, the weights and measures which they employ, interstate industrial activities, public improvements of national concern, relations with foreign nations which affect the whole people, and similar problems familiar in the daily lives of the pupils, they may be led directly into acquaintance with the federal government as a working institution.

Cultivating the socialized conscience—It was stated in the beginning paragraph of this chapter that the first objective in the study of civics is the acquisition of an intelligent knowledge of the functions and agencies of government, and of a standard of judgment of its efficiency. The second objective is the cultivation of the attitude of Good Will, and the Socialized Conscience. By good will is meant the neighborly feeling that wishes every one well, that prompts the individual to wish for every one all of the good

things he craves for himself. Coffin[1] defines the socialized conscience as involving the well-developed impulse to strive for betterment of the conditions of the whole people, and the habit of measuring values in terms of the quality of personality produced. Such a conscience is alive to the general welfare and disposed to value all things, measures and persons according to their contribution to the making of the finest specimens of manhood and womanhood. This conception is based on the principle that the end of all human affairs is the development of persons. These two attitudes are the mother of all the civic virtues, and it is in the cultivation of these impulses that the character of citizenship is effectively assured. There can be no sound citizenship without the foundation of adequate knowledge, but knowledge of ways and means of civic enterprises may be wholly antisocial unless the individual has developed wholesome emotional tendencies. "The course in civics will chiefly be helpful in creating the foundation of knowledge upon which good citizenship may rest, provided the pupil has a sound character and becomes public-spirited. Good government is impossible unless there is in the community an active public sentiment and one that is intelligently directed."[2]

The influence of the teacher—The method suggested for the study of goverment will go far toward cultivating these necessary mental attitudes. Taken in connection with the native chivalry of youth, these

1 JOHN H. COFFIN, "The Civilized Conscience."
2 HENRY E. BOURNE, "The Teaching of History and Civics."

problem-studies will likely be sufficient to motivate properly the majority of the pupils. The attitudes of the teacher will have great influence. Young people are highly suggestible. They are disposed to accept the viewpoint of the teacher who is positive in his own attitudes. However, the most certain way to awaken and fix an emotion is through the natural reaction of appropriate activity. Participation of the pupil in public-spirit enterprises will tend to make him permanently public-spirited. He becomes emotionally committed to the kind of activities in which he engages. The school, therefore, may accomplish much in the way of definitely motivating pupils for constructive citizenship by contriving situations and activities which employ them in affairs designed to secure social betterment. Any community offers abundant opportunity for enterprises of this character. Further suggestion applicable to this phase of the course will appear in the discussion of the third objective; namely, the development of skill in civic activities.

Practice in citizenship—It is essential in a system of effective training for citizenship to give the youth extensive experience in civic activites. The major portion of the time devoted to this phase of education might well be devoted to participation in civic functions under supervision—in what one would call supervised practice in citizenship. Just as the medical student has a term of experience in various clinics under the direction of experts, and the teacher must do a minimum amount of practice teaching, and as the student of mechanics is required to give possibly half

of his time to shop work, so the candidate in training for citizenship needs practice in the processes of his profession and to become acquainted with the conditions affecting his tasks by first-hand experience under the guidance of a properly qualified interpreter. Hence, the proposal that the scheme of education shall provide a laboratory experience in citizenship for the pupil, with formal instruction in civics heading toward such experience, and with the school itself and the community as the laboratory.

Utilizing school activities—The school offers many opportunities for such practice in the numerous student activities which have become a prominent part of school life. Such activities may develop into side shows which over-top the main tent, or they may be utilized for giving practical form to the essential processes of the school. The questionable feature of "school activities" is not so much the possibility of having too many of them as the danger, on the one hand, of being permitted to go without the intelligent guidance which connects them up to the educational program of the school rather than the pleasure life of the community, and, on the other hand, the chance that only a few of the students will get the emotional experience and training secured in active participation. The appeal to school loyalty, the emotional reaction of fighting for the colors of the school, rooting for the debating team, arduous and self-sacrificing practice in order that the school orchestra may excel its former record,—all such things which are so stimulating to high school youth may readily be turned to splendid account in developing public-spiritedness

and good will. It is a matter of simple adjustment to give pupils a valuable experience in participation in the government of the school.

Utilizing the community for pupil-practice in civic functions—But the field of most promising value to the teacher of civics is the community. The surveys suggested in another paragraph, directed to give the pupil an intimate and accurate personal acquaintance with his community and its agencies and conditions, are in themselves a valuable training. Such experience is rather certain to develop a permanent attitude of inquiry as to facts. In addition to all of these things it would seem feasible to effect an arrangement by which the pupil could serve an apprenticeship in some one or more departments of the community administration. A brief but real experience on the police patrol, on the sanitary squad, inspecting conditions and directing clean-ups, in the force of the superintendent of parks, as a helper in the city playground administration, and similar branches of municipal activity, would have immense educational value. The plan has been found to be entirely feasible in industrial education in some cities where arrangements have been made with industrial plants to take students into the shops for regular employment on a part-time adjustment. The suggestion now is that the same plan be extended to local governmental activities. By dividing the pupils into shifts alternating at study and work, the job would be continuously filled and the classroom work not seriously interrupted. In this manner an apprenticeship may be provided in:

Law enforcement.
Regulation of traffic.
Street construction and repairs.
Street and alley cleaning.
Beautifying the city.
Fire prevention.
Housing inspection.
Inspection of milk and water supply.
Inspection of markets and food storage.
Inspection of safety appliances in manufacturing plants.
Playground work.
Community recreation.
Enforcement of truancy law.
School board business.
Educational investigations.
Census taking.
Property assessment and taxation.
Juvenile court work, etc.

Through co-operative arrangements with churches, public libraries and kindred agencies similar training may be given in the work of children's clubs, library extension, mission work, and other social betterment efforts. The opportunities for this kind of work in rural communities are almost as numerous but, of course, more difficult. Yet the organization of many kinds of community service is entirely feasible as boys' and girls' club work, library extension, community recreation, mission work, service for the aged, and attention to the neglected. It is feasible to effect a working arrangement with the local health author-

ities to assist the rural Red Cross nurse, to survey rural sanitary conditions and to plan programs for betterment. Under the county agricultural agent various soil, drainage and crop surveys may be made looking to the planning of a county program for agricultural improvement. The county highway superintendent could utilize high school helpers in studying the county road problem and planning for developments. These are suggestive of activities within the compass of the high school pupil's ability and involve lines of investigation and work which will appeal to him. Not only will such apprenticeship lead to a better understanding of the nature of civic problems and develop skill in meeting the practical situations of life, but the service rendered the community will react upon the pupils, stimulating their affection for the people and the causes which they serve.

"Certain well-known principles of educational psychology are indispensable in the teaching of civics. The first of these is that the pupils' interest must, first of all, be secured. It is far better to stimulate interest and to impart very little detailed information than to fill the mind with more or less well-understood facts at the expense of interest. Interest, once killed, is hard to regain; while with the interest thoroughly kindled, the facts will easily follow. Furthermore, it is the individual's interest, and not his knowledge, that leads to action. The right kind of interest behind a very few facts will lead to good citizenship, while any number of facts without the interest will fail to do so.

"It is also a matter of common knowledge that the surest way to kindle and maintain the child's interest is to build on his own experience, passing constantly from the facts of his experience to related facts just beyond his experience, and back again to his own experience." [1]

Books for the Library

BOURNE, HENRY E. "The Teaching of History and Civics," Longmans, Green & Co., New York.

BRYCE, JAMES. "The American Commonwealth," The Macmillan Co., New York.

COOLEY, THOMAS McI. "General Principles of Constitutional Law in the United States," Little, Brown & Co., Boston.

DEWEY, JOHN. "The School and Society," University of Chicago Press.

DUNN, ARTHUR W. "The Community and the Citizen," D. C. Heath & Co., New York.

FAIRLIE, JOHN A. "Local Government in Counties, Towns, and Villages," The Century Co., New York.

FISKE, JOHN. "Civil Government in the United States," Houghton Mifflin Co., Boston.

ROOSEVELT, THEODORE. "American Ideals," G. P. Putnam's Sons, New York.

TOCQUEVILLE, ALEXISDE. "Democracy in America," D. Appleton & Co., New York.

[1] ARTHUR W. DUNN, "The Community and the Citizen."

Note. For more detailed suggestions as to topics and method of treatment in line with this approach, the student will find valuable help in Bulletin 650, U. S. Bureau of Education, the report of "The Teaching of Community Civics" by a special committee of the N. E. A. Commission on the Reorganization of Secondary Education.

Summary

The course in civics should be practical rather than academic. Its object is good citizenship, which rests upon a proper emotional experience and participation in wholesome civic activities, quite as much as or more than on a body of knowledge. The values sought are social and moral.

The three objectives are: (1) such acquaintance with the agencies, processes and principles of citizenship as will become a standard of judgment for determining the civic worth of men and measures; (2) the development of the socialized disposition; (3) skill in the processes of citizenship, particularly in local functions.

Civics should be largely a field study, and devoted primarily to local conditions and activities. The problem or project-method should be employed.

The study of the community should include (1) the several needs to be satisfied, (2) the kind of person and agency required for satisfying these needs, (3) the consequences of good and bad service, and (4) a conception of what constitutes efficiency in each line of service.

Class surveys have been found very effective.

The older civics placed the stress on office-holding; the new civics places the emphasis on voting. The study of the functions of the state government should begin with the forms of service rendered within the community by state agencies.

In like manner, the federal government should be

approached through local services, as, for instance, the service of the post office.

The attitude of the teacher has very much to do with determining the social disposition of his pupils. It is necessary that he be social minded.

The major portion of the time devoted to civics might well be devoted to participation in civic activities under supervision—in supervised practice in citizenship. In many departments of the municipal government, provision may readily be made for giving the high school pupils first-hand experience.

References

Bulletins on Public Roads, U. S. Government.

"Community Civics," U. S. Bureau of Education Bulletin.

Forman, Samuel E. "Advanced Civics," The Century Co., New York.

Forman, Samuel E. "The American Democracy," The Century Co., New York.

Fuller, Robert H. "Government by the People," The Macmillan Co., New York.

Goodnow, Frank J. "City Government in the United States," The Century Co., New York.

Hart, Albert B. "Actual Government as Applied under American Conditions," Longmans, Green & Co., New York.

Henderson, Charles R. "The Social Spirit in America," Scott, Foresman & Co., Chicago.

Hinsdale, Burke A. "American Government, National and State," American Book Co., New York.

Howe, Daniel W. "The Puritan Republic of the Massachusetts Bay in New England," Bobbs-Merrill Co., Indianapolis.

HOWE, FREDERICK C. "The City, the Hope of Democracy," Charles Scribner's Sons, New York.

MACY, JESSE. "The English Constitution," The Macmillan Co., New York.

PETERSON, HENRY J. "Teaching of Citizenship," Houghton Mifflin Co., Boston.

REINSCH, PAUL S. "American Legislatures and Legislative Methods," The Century Co., New York.

ROBERTS, PETER. "Civics for Coming Americans," Association Press, New York.

ROBINSON, CHARLES M. "The Improvement of Towns and Cities," G. P. Putnam's Sons, New York.

ROBINSON, CHARLES M. "Modern Civic Art," G. P. Putnam's Sons, New York.

SNEDDEN, DAVID S. "Civic Education," World Book Co., Yonkers, N. Y.

WILCOX, DELOS F. "The American City: a Problem in Democracy," The Macmillan Co., New York.

WILSON, WOODROW. "The State," D. C. Heath & Co., New York.

WOODBURN, JAMES A. "The American Republic and Its Government," G. P. Putnam's Sons, New York.

CHAPTER X

SOCIAL STUDIES IN THE SENIOR HIGH SCHOOL

The special study of community civics properly belongs to the junior high school. The courses in history in the senior high school form the groundwork of instruction in the more specialized social sciences. The student recalls that stress was laid on the principle that the main reason for teaching history is to reveal the nature of our civilization to-day as developed out of the past, and to prepare the pupil for intelligent citizenship—its primary function is to socialize the young citizen. These applications of past experience will go far toward fitting him for the privileges and responsibilities upon which he will soon enter. To give no more training than this provides will be inadequate to the demands of the situation as more specialized instruction is necessary.

The aim of the high school is to prepare its pupils, who will not continue their education in college and university, for active life in the present social order. This preparation must relate the individual so intelligently to the existing conditions that he may take advantage of the situations which inure to his welfare, and also protect himself from harm. Our social order is largely organized on the economic basis. Modern scholarship avers that there is a body of

economic law operating to govern material welfare, just as biological law governs physical well-being and as psychological principles govern mental processes. Practical men accept the doctrines of the scholars, and transact business accordingly. The man, therefore, who is equipped for making the proper personal adjustments of his program to existing conditions, must be trained in those principles of economics which constitute the platform of American life.

Importance of a knowledge of industrial relations—Intelligent thinking concerning industrial problems requires an understanding of the fundamental principles of economic relations and processes. The laborer must possess this undertanding if he is to think out his own problems. The factory owner must have the same insight. The common man, who so much of the time is between the upper and nether mill-stones, needs to see through the situation. Every man, either as producer or consumer, is confronted with personal problems growing out of the industrial situation, which problems must be solved if his welfare is to be conserved. He ought to be able to think out these questions for himself. He must be able to do so if American society is to remain democratic. In fact, democracy means largely this particular kind of ability developed and functioning in the common man. Industrial democracy is this ability of the worker, and of the other man, each to think adequately for himself, rather than ownership of the factory by the workers. Hence, there is the demand for a carefully organized course in funda-

mental economic principles in the high school, in the interest of the general welfare and of true industrial democracy.

Political issues for most part economic—The whole people participates in the government of this nation by means of the ballot. The issues decided by popular vote at municipal, state and national elections are for the most part economic. They relate to such matters as industrial relations, to finance, taxation, conservation of natural resources, public improvements, and regulation of public utilities. To vote on these questions intelligently requires an understanding of the underlying principles. The decision of these questions is of vital consequence to community and state. Public and private welfare are at stake. If the voter does not cast his ballot in the light of a proper understanding of the issues, he votes blindly. He becomes the easy victim of the demagogue; his true citizenship is lost. He casts the ballot of his boss, not his own. He votes in the interest of the men whose judgment governs his vote, and, as is well known, too often not in his own interest. That almost universal ignorance of the facts and principles really involved in recent popular elections does exist, the reader well knows, and that this ignorance is endangering American democracy will be patent upon first thought.

The individual both an industrial factor and a citizen—Every man and woman sustains both of the relations to the economic order mentioned above,—an industrial factor and a citizen. He cannot escape these relations and their responsibilities. For we all

are consumers and all should be producers; all of us have assumed the responsibilities of voting and are harassed with the burdens of taxation. Certainly the school, as the agent of society for maintaining itself at proper levels, must make ample provision for training the new generation for these unescapable responsibilities and duties. No other agency is in position to undertake this service. It seems evident that there is urgent reason for including a course in elementary economics in the high school.

The educational values of such a course are obvious. First, there is the preparation afforded for a fuller understanding of history and for a better appreciation of vocational guidance and training. There is the practical value set out in the preceding paragraphs, and a large socializing influence. The student who is infected with the hateful class prejudice, which is the greatest obstacle in the way of the establishment of social justice, gets a truer perspective of social factors and functions in the study of economics that leads to a more tolerant spirit and makes agreement possible. A grasp of economic fact clears away the fog of popular thought, and with the disappearing mists go the miasmas which poison the hearts of the people. Greater moral stability follows. Much of the incitement to private and public crime is destroyed. The truth makes for freedom, and for sanity and healthy-mindedness as well. The moral value is large and there will also be very considerable cultural values realized. The ability to grasp essential truth is always liberalizing; to think for oneself is to be free in the best sense. No more

desirable reconstruction is conceivable than to set American citizens right in their economic thinking. The disciplines to be derived therefrom are the same as in the other studies relating to institutional life.

Teaching Objectives

1. Knowledge objectives.

The suggested instruction would have for its knowledge objective the presentation of the fundamental facts and principles of the science of economics in an elementary form, addressed to the range of ability and experience of high school students of the third and fourth years. Among the many topics which such a presentation would include are a number which should receive special emphasis and careful consideration:

A proper conception of the nature and forms of wealth.

The things which contribute to the wealth of a people.

That contribute to the wealth of an individual.

What is property.

How is property justly acquired.

The responsibilities of ownership.

Sources of value.

Measures of value.

The principle of supply and demand.

What is capital.

What is labor.

The origins of capital in nature and in labor.

Forms and varieties of labor.

The relation of capital and labor in the industrial situation.

The working man as producer and consumer.

What are wages, who pays them.

What is a living wage.

Interest and rents.

The relation of production, distribution and consumption.

Who are the producers.

Who are the consumers.

What function does the distributor perform.

The economic significance of the waste of materials.

Of time and energy.

Of poor workmanship.

What is money.

Forms of money.

What determines interest rates.

What determines prices.

Forms of taxation.

Principles of correct taxation.

Economic aspects of insurance.

Of public improvements.

The function of the banker.

Of the promoter.

Of combinations of capital.

Of combinations of labor.

Of combinations of consumers.

2. Feeling Objectives.

True citizenship requires the emotional support of a lively admiration of human institutions as well as a concern for the neighbor's welfare. This admiration is a by-product of insight into the organization and

interdependence of institutions. No study opens up such commanding prospect more fully than economics, nor gives the individual greater assurance with reference to social stability. In addition to this service in creating a wholesome attitude of mind, the study of our subject has a large curative value which the teacher should strive to realize, namely, to free the minds of his students from the bias of class-consciousness, and to give them what is well called the "socialized point of view."

3. Discipline objectives.

In addition to the general discipline of orderly study, the course should result in the habit of the scientific reference of economic questions to first principles rather than to party and class programs.

Methods of Teaching

The method of teaching elementary economics in the high school depends primarily upon the preparation and personal qualifications of the teacher. If he possesses adequate scholarship in his subject, the scientific temperament, and quickness of grasp of concrete embodiments of principles, within the range of his pupils' observation, it is recommended that the "problem method" be employed, supplemented by lectures, readings, reports, and class discussions.

Political Science and Sociology

Argument, almost if not equally strong, might be advanced in support of specialized courses in political science and elementary sociology. Exceedingly

profitable courses thoroughly adapted to secondary school conditions are feasible in each of these branches of social science. The traditional course in civil government can not be justified for the reason that it is concerned with governmental machinery, while what is needed as a basis of good citizenship is insight into the nature and consequence of political principles. No defence is required for the statement that the common man to-day needs a clearer apprehension of the principles of representative government, of democracy, of nationalism, and of internationalism. There is need of a clearer conception of governmental functions as related to control of property, political regulation of industry, national control of education, the paternalistic tendencies of modern governments. As long as the election of officials is entrusted to popular vote, the determination of governmental policies rests with the masses whose immediate leadership comes from the high-school-trained element of the population. The intelligence of the ballot, therefore, depends upon whether the high school responds effectively to the need of political insight and proper conviction.

As we have said before, the man is a seven-sided person. He is not only a worker and a citizen, but also a member of a family, a church man, a school man, a man of leisure, and a neighbor. He is vitally concerned in many problems in addition to those of making a living and securing justice. He finds his life conditioned by the activities of the church, of various educational agencies, by agencies which provide for recreation, by conditions which affect health, by

the entire system of institutions, processes, and agencies which make up what we call his social environment. He needs to understand these institutions —their functions, their interdependence, the value of the contribution each makes to the welfare of the individual. He needs, also, to understand how each of these institutions and agencies depends upon him, and thus how the general welfare rests upon the fidelity of his service in his various relationships. In these premises rests the demand for the inclusion of the elements of sociology in the high school program. To be sure, the instruction in history may be made rich with sociological insights, but there is general agreement that the results thus secured are not sufficiently definite, and, particularly, that they are not adequately related to the local situation of the pupil.

At once, however, there arises the serious difficulty of the already overloaded curriculum. There obviously is not enough time available to give each of these subjects a special place, even if they should be properly reorganized for secondary students. The best solution of the problem yet offered is the plan proposed by the Commission on Reorganization of Secondary Education in its report on Social Studies in Secondary Education, published as Bulletin, 1916, No. 28, U. S. Bureau of Education. The plan, in brief, is "to study actual problems or issues, or conditions, as they occur in life, and in their several aspects, political, economic, sociological. These problems or issues will naturally vary from year to year, and from class to class, but they should be selected on the ground (1) of their immediate interest to the

class, and (2) of their vital importance to society." To illustrate, the following suggestion for the treatment of the immigration problem is quoted from page 54 of the Bulletin:

"The problem of immigration might impose itself upon the attention for any one of a number of reasons. It will have been touched upon in an elementary way in community civics, and doubtless will have come up in a variety of ways in connection with history; but it may now be considered more comprehensively, more intensively, and more exhaustively. One of the chief aims should now be to organize knowledge with reference to the economic, sociological, and political principles involved.

"*Economic relations of immigration:*

Labor supply and other industrial problems (on the side of 'production').

Standards of living, not only of the immigrants, but also of native Americans as affected by immigration (on the side of 'consumption').

Relation to the problem of land tenure in the United States.

"*Sociological relations of immigration:*

Movements and distribution of population; congestion in cities; etc.

Assimilation of immigrant population; admixture of races.

Vital statistics, health problems, etc.

Educational and religious problems involved.

Social contributions of immigrants; art, science, ethics.

"*Political and Governmental relations of immigration:*

Political ideals of immigrants; comparison of their inher-

ited political conceptions with those of the country of their adoption.

Naturalization; its methods, abuses, etc.

The courts in the light of the processes of naturalization.

Administration of immigration laws.

Defects and inconsistencies in the methods of our Government, as shown in legislation regarding immigrants and in the administration of the laws.

Problems of municipal government arising from or complicated by immigration."

In a similar manner, studies may be made of the following questions, extending consideration of each as far as the time available will determine:

The cost of living.
The burden of taxation.
The negro in industry.
Nationalization of the mining industry.
Nationalization of railroads.
Peace plans.
Recognition of revolutionary governments.
The primary election.
Care of the defective class.
The state highway.
Public playgrounds.
Co-operative marketing.
Is the bank the friend or foe of the workingman?
What have the churches done for our community?
The short working day.
Should the employee participate in the management of the factory?
Plans for betterment of our town.

Survey of local sanitary district.
Survey of housing conditions in the community.
Provisions for recreation in the community.
Analysis of local, town, or city budget.

The primary object of studies of this type is the cultivation of social mindedness rather than a fund of information. This point of view is well stated by the Committee:

"The purposes of secondary education and not the intrinsic value of any particular body of knowledge should be the determining consideration. From the standpoint of the purposes of secondary education, it is far less important that the adolescent youth should acquire a comprehensive knowledge of any or all of the social sciences than it is that he should be given experience and practice in the observation of social phenomena as he encounters them; that he should be brought to understand that every social problem is many-sided and complex; and that he should acquire the habit of forming social judgments only on the basis of dispassionate consideration of all the facts available. This, the committee believes, can best be accomplished by dealing with actual situations as they occur and by drafting into service the materials of all the social sciences as occasion demands for a thorough understanding of the situations in question."

Summary

As modern society becomes more fully organized on an economic basis it becomes necessary that the school train its pupils in the economic principles which constitute the platform of American life. The com-

mon man needs such training as well as the leader, the laborer as well as the capitalist.

The future of American democracy depends upon the mutual trust and confidence that can come only from the ability of the worker and the employer to think their problems through, each for himself.

The sway of the demagogue in American politics as well as in industry is due to the ignorance of fundamental economic principles on the part of the ordinary citizen.

"Problem study" offers the most effective approach to the principles to be developed. In addition to the presentation of the elementary facts and principles the teacher should seek to establish the "socialized point of view."

Equally good cases might be made for specialized instruction in political science and sociology. Our citizen to-day needs a clearer apprehension of the principles of representative government, of democracy, of nationalism, and of internationalism.

The intelligence of the ballot depends upon whether the high school responds effectively to the need of political insight and proper conviction.

The individual is a member of the family, a school man, a church man, a neighbor and a man of leisure, as well as a worker and a voter. He is vitally concerned with the problems of each of the institutions of which he is a constituent member. Social welfare depends upon whether he has acquired proper conceptions and right attitudes as to each of these social relations.

The most feasible provision for instruction in

economics, political science and sociology in the high school seems to be that suggested by the Commission on Reorganization of Secondary Education, namely: the study of the actual problems or current issues, considered as to their economic, political and sociological aspects, primary objects being the inculcation of basic principles involved and the development of social mindedness.

References

Abet, Adam. "Social Conscience," Co-operative Publishing Co., Bridgeport, Conn.

Coffin, Joseph H. "Socialized Conscience," Warwick & York, Inc., Baltimore.

Dunn, Arthur. "Social Studies in Secondary Education," U. S. Bureau of Education Bulletin, 1916, No. 28.

Ellwood, Charles A., and Taylor, Carl C. "Syllabus for an Elementary Course in Sociology," Missouri Book Co., Columbia, Mo.

Goodnow, Frank J. "Politics and Administration," The Macmillan Co., New York.

Henderson, Charles R. "The Social Spirit in America," Scott, Foresman & Co., Chicago.

Hocking, William E. "Human Nature and Its Remaking," Yale University Press, New Haven, Conn.

Leary, Daniel B. "Group-Discussion Syllabus of Sociology," College of Arts and Sciences, University of Buffalo.

Mecklin, John M. "Introduction to Social Ethics," Harcourt, Brace & Co., New York.

Moore, "Status of Certain Social Sciences and the High School," U. S. Bureau of Education.

Morrison, William D. "Juvenile Offenders," D. Appleton & Co., New York.

SCHNEIDER, HERBERT W. "Science and Social Progress," Lemcke & Buechner, New York.

SNEDDEN, DAVID S. "Educational Sociology," The Century Co., New York.

SNEDDEN, DAVID S. "Sociology for Teachers," The Century Co., New York.

SNEDDEN, DAVID S. "Educational Applications of Sociology," The Century Co., New York.

SUMNER, WILLIAM G. "What Social Classes Owe to Each Other," Harper & Bros., New York.

TUFTS, JAMES H. "Ethics of Co-operation," Houghton Mifflin Co., Boston.

U. S. Bureau of Education Bulletins. "Social Studies in the High School."

WARNER, AMOS G. "American Charities," T. Y. Crowell Co., New York.

ZUEBLIN, CHARLES. "A Decade of Civic Development," University of Chicago.

CHAPTER XI

THE TEACHING OF SCIENCE IN THE HIGH SCHOOL

Science and the humanities distinguished—Before taking up the discussion of how to teach the several sciences as high school subjects, it may be profitable to consider for a moment the educational functions and differences of science studies as distinguished from the humanities. An understanding of these relationships is necessary to a proper conception of the place of science in the curriculum and as a basis for an intelligent co-ordination of work in these two groups of studies. This understanding should prove as valuable to the teacher of English or history as to the science teacher.

Science deals with material facts, the humanities with human factors—In the first place, science deals with the material elements and processes of the world, while the humanities deal with what have been variously called the spiritual or human elements. The sciences deal with the physical phenomena which make up what we call Nature. The humanities deal with the life, nature and especially the behavior of man—his reactions to nature, his institutions, language, activities, emotions, hopes, dreams, faiths. The youth must live in a dual world—a world of natural forces and processes and also a world of men. Clearly he must be acquainted with the facts of both of these

worlds to which he must adjust himself. Hence, a properly balanced program of study should include a fair division of time between these two groups of studies.

Science deals with the invariable, the humanities with the contingent—In the second place, these two groups of studies deal with different varieties of truth. Science deals with the invariable, the certain, the valid. There can be no apprehension with regard to the validity of the facts of science once they are established. The laws of nature we must accept as having certainty. Once the composition of a chemical compound is determined, it may be accepted with the fullest assurance. There is never any remainder. Its performance may be confidently calculated. The stars in their tremendous journeys through the heavens are so constant that their paths may be mapped and their return timed to the minute. There is a "mathematical certainty" about the laws of mechanics. Even in biology the student finds the same atmosphere of certainty. This quality of invariableness is one of the characteristics of the scientific group. Over against this quality is the fact of contingency in all human affairs. The personal element is not so calculable. The student of history may establish a perfect parallelism of situations and yet he can not confidently predict that an individual or group of men will act the same way the second time. Human spirit refuses to be bound by laws and there is ever present an element of arbitrariness in human behavior. Man always does the unexpected thing, the inexplicable, and so there can not be a truly scientific study of human

history. The course of human events can never be calculated as the astronomer calculates the courses of the stars or the chemist the action of his chemicals. We can measure the behavior of a ray of light, but not the behavior of an idea. The vagrant heart and untamable will can not be anticipated. That is, everything in human behavior is contingent upon an unknown and incalculable factor. This principle is embodied in the old adage, "The exception proves the rule." Hence, we speak of ethics, rhetoric, grammar, politics, and linguistics as normative subjects. That is, they deal with standards of acceptable or average or the most frequently occurring behavior, rather than with necessities. For this reason the student of Latin is busied as much with learning exceptions to the rules as with learning the rules. The total influence of this feature of the study of the humanities on the mental habits of the pupil must be great, just as several years of work on subjects in which he deals with the invariable must give a very definite quality to his mind. This again would indicate the necessity of the inclusion of a rather heavy program of scientific study to balance the humanities in the curriculum, in order that the pupil may have equal training in the two varieties of judgment which the kind of world he lives in will require of him.

Science exact, the humanities inspirational—Another difference between science and the humanities, likewise indicating the need of both in the pupil's program, is in the nature of the generalizations involved. The generalizations of science follow upon the analysis and synthesis of situations in which all factors

may be accounted for; upon abstractions and comparisons equally careful; and may be pushed up to the highest level of inquiry. On the other hand, the generalizations of the humanities involve what has been called "artistic induction," and usually are largely a matter of inspiration.

The contrast—There is thus a certain opposition of science and the humanities. The relation might be better described as paradoxical, as the following shows:

Science	*The Humanities*
1. Gives command of nature	Give command of men
2. Trains in exact thinking	Train in contingent thinking
3. Trains for scientific induction	Train for artistic induction
4. Gives freedom from tradition	Give the unity and strength of tradition
5. Gives the laws of wholesome living	Give inspiration for wholesome living
6. Introduces the pupil to the world of nature.	Introduce the pupil to the world of spiritual reality.

Each group of studies has its own peculiar educational functions and both are necessary in the preparation of the youth for successful living.

Scoring of educational values—The educational values of the science studies as a group have been scored as follows, employing 0, 1, 2, and 3 to indicate the four several degrees of value.

I.	Instrumental Values.	
	Introductory-Preparatory	3
	Vocational	3
	Socializing	0
	Moral	1
	Conventional	2
	Health	3
II.	Cultural.	
	Liberalizing	3
	Sentimental	2
	Reconstructive	3
III.	Disciplinary.	
	Growth of Mental Power	3
	Mental Attitudes	2
	Valuable Habits of Thought	3

These values dependent on quality of teaching—To be sure, the values assigned above are in large measure conditional upon the quality of the instruction given and the amount of the subject covered. The latter needs as much emphasis as the former. It is generally agreed that the educational results of less than a year's work in a given science are very small, if at all appreciable. The most successful science teachers are almost unanimous in the opinion that two years of continuous work in a given subject is the minimum for real value. The pupil should by all means take two or even three years in one science rather than distribute this time over two, three, or more sciences. The semester courses still quite prevalent in smaller high schools are indefensible. For many reasons it is desirable that the pupil have work

in both biological and physical science, and the exigencies of program-making may, of course, require a compromise of the time allowance. The point to be made in this connection is that the values listed above depend upon continuous study of the particular science for a sufficient period of time, to give the pupil real mastery of the elements of the science and its applications.

Two dangers pointed out by Judd—The values depend also upon the clearness of teaching, upon the development of fundamental concepts, and especially upon pushing the study of each principle through to an understanding of its practical applications. Judd calls attention to two dangerous tendencies in current science teaching, one of which, over-specialization, may easily flow out of the suggestion of the preceding paragraph. The other is the divorce of theory and application. Something will be said in a subsequent paragraph with reference to the motive of science study, but clearly a subject cannot function fully in the pupil's life until it is carried over in his mind and connected up with his life. Every discussion should be pushed through to a program of action. The vocational and inherent values will depend wholly upon working out the applications of the studies; the cultural values, on the other hand, depend largely upon the mastery of the fundamental concepts, laws and principles of the subject. They are secured as a by-product of the high-level generalizations which are possible in all of the sciences. The disciplinary values result only from vigorous instruction and training. All of which means that the educational value of

science in our high schools depends upon the quality and quantity of teaching, upon the definiteness and vigor of the reaction secured from the pupils. The studies do not possess any intrinsic values which function automatically, and the teacher may properly assume that the value of his course depends upon his teaching rather than upon the subject. It may be of the highest worth, or it may be entirely worthless.

The motive of scientific study—While the discussion of each topic should be pushed through to its practical application, the *motive* of the study would be the pupil's *demand for the truth*. Historically, the motive of science is the love of truth, not the solution of practical problems. The history of the amelioration of human life gives conclusive proof of the principle that pure scholarship as distinguished from applied science is the source of progress. This fact greatly needs emphasis with teachers of science at the present time. They should see the difference between the practical application of principles as the last step in the teaching process, and the quest for truth as the motive of the pupil. There is a popular tendency, both in our colleges and universities and at large, to attach greater importance to applied knowledge than to pure scholarship. This tendency is fairly characteristic of current education, and is manifest in textbooks, courses of study, educational doctrine, and the demands which the public makes of the schools. There is a very general disdain of pure science, of scholarship for the sake of scholarship, of culture for the sake of culture. The demand is for applied science, for so-called useful knowledge, and culture is

rejected as unworthy of busy men. The demand is that the schools shall confine themselves to baking bread, but the fact is that the current delimitation of the school is undemocratic. In the first place, it is truth pursued for its own sake which makes men free. The great advances in human liberty have resulted from discoveries and scientific investigations pursued with no thought of practical applications. Ben Franklin, flying his kite on the commons of Philadelphia, was intent upon but one thing, the discovery of the workings of a natural force which the Creator had put into the machinery of the universe. So with Descartes, Harvey, Galileo, Faraday and Darwin. These men sought the truth for the sake of the truth. Like Paul, who would "press toward the mark for the prize of the high calling of God in Christ Jesus," they sought merely to read the mind of God in his creation.

Classification of the Sciences

The following classification of the sciences available for the high school is suggested by De Garmo:

I. The Exact Sciences
   Mathematics
   Physics
   Chemistry
   Astronomy
II. The Biological Sciences
   Zoölogy
   Botany
   Physiology (Bacteriology, Embryology, etc.)

III. The Earth Sciences
Physical Geography
Geology.

The exact sciences are those in which chemical and mechanical forces are dominant. The facts with which they deal are comparatively stable, their reactions constant. These relations are quite largely quantitative as well as qualitative, and the laws governing them are expressed in mathematical terms. The mathematical subjects are for this reason placed in this group. Physics and chemistry, dealing with the forces which produce changes and determine the status of masses and of the molecules which enter into the composition of matter, obviously belong here. Astronomy, dealing with the organization of the whole stellar system, makes the fourth member of this group.

The biological sciences are unified in the fact that all of them deal with the phenomena of living matter, with growth and development. This common subject matter also sets them off from the exact sciences. They are further distinguished in the methods employed. Their phenomena do not ordinarily lend themselves to quantitative measurement and mathematical representation.

The third group comprises those subjects which deal with phenomena combining the mechanical and chemical forces on the one hand, and the evolutionary forces on the other. They also combine in large measure the methods peculiar to each of the other two groups.

This classification suggests that with reference to subject matter the study program should provide for a reasonable minimum of each subject at some place in the curriculum. With reference to the disciplinary functions, the program should contain at least mathematics, one other exact science and one from each of the other two groups. The classification, considered in connection with the particular methods involved, indicates that the sequence of the subjects in the outline is also the logical order in which they should be presented to the pupil.

Summary

In the ideal study program the sciences and humanities are well balanced, the former offering a knowledge of man's environment, the latter helping to an understanding of man himself. Science gives the laws, the humanities the inspiration for correct living.

Science is richer in cultural and disciplinary values than in immediately practical applications.

The minimum of time given to a science in the high school should be not less than a year. The values depend upon continuous study of the subject for a sufficient period to enable the pupil to acquire some degree of real mastery.

The values depend also upon the clearness of teaching, upon the development of fundamental concepts, and, particularly, upon pushing the study of each principle taught through to an understanding of its practical application.

There are two dangerous tendencies in much of

the science teaching in high schools: (1) overspecialization, and (2) divorce of theory and application.

Historically, the motive of science is the love of truth, not the solution of practical problems, and the motive of the pupil in high school science should be his demand for the truth.

The science program should provide for an introduction to each group of sciences.

References

Caldwell, Otis W., and Slosson, Edwin E. "Science Remaking the World," Doubleday, Page & Co., Garden City, New York.

De Garmo, Charles. "Principles of Secondary Education," Vol. I, The Macmillan Co., New York. 1907.

Eikenberry, William L. "The Teaching of General Science," University of Chicago Press.

Twiss. "Principles of Science Teaching," The Macmillan Co., New York.

Woodhull, John F. "The Teaching of Science," The Macmillan Co., New York.

CHAPTER XII

HIGH SCHOOL MATHEMATICS

Confusion as to the place of mathematics in the high school—In recent years there has been considerable confusion with regard to the content and organization of secondary mathematics, and, at present, there is a decided movement in the direction of reducing the amount required. In the traditional course of study mathematics shared with foreign language the place of honor in the curriculum. These subjects were the constants around which the program of instruction was organized. With the increase of the amount of history, English, science, and vocational work, the tendency has been to reduce these subjects, once regarded as the essentials of culture as well as of college preparation, to a subordinate position. At the same time the problem of the proper sequence of mathematical studies in the program has arisen. Many proposals for reorganization have been advanced. Some of these have been embodied in new textbooks and carried out in a few schools.

Results of instruction are unsatisfactory—This confusion is, in part, indicative of progress in the pedagogy of secondary mathematics, but is also the result of the unpreparedness of teachers to meet the current demand that every subject in the course shall

clearly justify itself. That is, the confusion is due chiefly to disappointment in getting tangible results. The experience of the colleges has shown that high school graduates are poorly prepared for college mathematics. The utilitarian critics find, at the same time, that the students have little or no increase of practical ability. The extension of the elective system to the high school has quite generally removed the protection formerly enjoyed by algebra and geometry, and has revealed that pupils do not like these studies. Under the increasing application of the principle of interest as a guide in determining the course of study, the mathematical subjects have suffered severely.

Reduced level of student ability partly responsible—There are several reasons for these unsatisfactory results. First of these is the reduced level of student ability because of the increased enrollment in the secondary schools. The large relative growth of high school attendance is most gratifying from the sociological point of view, but necessarily presents pedagogical difficulties which were not met with in the smaller schools of former years. The larger the percentage of the population brought into the school, the less select the student body; that is, the larger the number of pupils who find the exacting work of mathematics difficult, hence uninviting. This aspect of the problem is augmented by the further fact that a large element of the student body is not seriously intent upon study. Naturally, a subject whose exactions cannot readily be escaped will be irksome to such students. Two views may be taken of this condition brought about by lowered mental level and weakened morale.

One leads to the suggestion that secondary mathematics be optional altogether or that the amount be largely diminished. The other view leads to the proposal to make the course easier by eliminating the more difficult portions and making the remaining material as concrete as possible.

A misconception of objectives—A second reason for the unsatisfactory status of the subject is poor teaching. Possibly in the average high school no other study is as poorly taught. The explanation is found in a prevalent misconception of value, on the part both of teachers and of critics. The objective set up, at least generally, is immediate utility. The traditional view is that algebra and geometry, like arithmetic, are "practical" subjects in the sense of being immediately available in the vocations. But, as a matter of fact, any other subject in the curriculum has more applicability than either algebra or geometry. Their values are to be found elsewhere—in their disciplines and culture, rather than in the value of their content or their logical necessity to other studies. It is true that the science of geometry is rooted in vocational origins. It began in Egypt in connection with the annual farm surveys made necessary by the overflow of the Nile, and there and elsewhere in connection with the solution of construction problems which arose with the development of architecture and other construction work. While a simple body of geometrical knowledge was thus developed, geometry as a science was elaborated by the Greeks while under the scientific impulse. Their interest in the subject was purely intellectual. They were con-

cerned with it as pure science, not as an art. And the subject remains a pure science. While many practical applications are possible, its motive is strictly scientific and its method logical. The teacher must necessarily have this point of view, and must understand that his methods and objectives are conditioned by the fact that he is dealing with pure science, that its controlling motive is strictly scientific, and that its outstanding educational values are to be found in the form of scientific training.

The motive in arithmetic—Arithmetic grew up entirely as a practical subject. Its motive, historically and inherently, is vocational. It began as counting for the immediately useful purpose of numbering property. With the development of industry each new occupation created its own particular arithmetic. Thus, for the greater part of history, there have been as many arithmetics as there were trades, including the profession of public entertainment which developed for obvious reasons puzzle arithmetic, the bane of the school boy. It is only recently that the various trade arithmetics were gathered together in one volume and made a subject of school study. While the pedant presents strong claims for its value as discipline, the motive of arithmetic remains predominantly vocational, although such utility evidently is much over-rated.

The motive in algebra—In the case of algebra there never was any serious vocational motive. Its interests, conceptions, methods, objectives and history have been consistently scientific. In all textbooks there is an effort to apply algebraic processes to the solution

of practical problems, but such application is a matter of extension of arithmetic rather than of vocational functioning of algebra. Certain instrumental values are available in the use of algebraic processes in engineering and physical science. On the whole, however, algebra is a pure science, consistently scientific in its motive and its value.

The nature of mathematical studies—It is necessary to the realization of the values inhering in algebra and geometry, and therefore to proper methods, to understand that they are *form* rather than *content* studies, disciplines rather than instrumentalities, and controlled predominantly by the motive of pure science. Historically, they were developed as so much truth to be acquired for its own sake. This was the objective of the early mathematicians, and it is the objective which to-day secures the best values either as disciplines or as utilities. The assumption in this discussion is that the motive of pure science, the desire to acquire mathematical truth for its own sake, is the motive with which the teacher must work in order to get worth-while results; that values to be secured are primarily intellectual disciplines, and that practical utilities are incidental, although real.

Their sequence—The sequence of arithmetic, algebra and geometry is largely arbitrary. The conventional order is neither historically nor pedagogically necessary. Algebra can be taught with knowledge of merely the fundamental processes of arithmetic, and geometry can be taught without a knowledge of either of the other subjects. The value of arithmetic in daily life is sufficient reason for making it first in the se-

ries. It matters little which of the remaining two is taken up next. The proposal to combine them into one general course, except in the junior high school, has received scant encouragement. It has not worked out well experimentally, and besides is pedagogically inadvisable. As will be seen in a subsequent paragraph, algebra and geometry deal with different subject matter and employ different mental processes. It does not seem feasible to combine them into any sort of a unity without totally destroying their scientific value, to say nothing of losing the advantage of concentration.

Disciplinary and cultural values—It was indicated above that the educational values in mathematics are primarily disciplinary and cultural. Possibly no other subject in the secondary curriculum is better fitted in its very nature for the development of valuable mental habits. Mathematical study is progressive, advancing by steady, even gradations, producing breadth and depth of the mind. It trains the mind to "exact and progressive thinking, to adequacy of conception and precision of expression, to energy of attention, to clearness of inner vision, to the perception of necessary truths."[1] It quickens the scientific conscience, and is in itself "a school of scientific thinking, terminology, and expression."

A necessary instrument in all investigation—Mathematical study also is necessary as an instrument in all scientific investigation. De Garmo says: "The world is so constituted that it cannot be apprehended without some means for discovering and measuring

[1] CHARLES DE GARMO, "The Studies of the Secondary School."

its quantitative relations."[1] Again, he says: "It is when we examine the relation of mathematics to science, both pure and applied, that we see most forcibly its indispensability as a propædeutic. Astronomy was once studied almost exclusively as a mathematical science, as in the days of Copernicus, Kepler, and Newton, and still has its mathematical side. So dependent is any precise and advanced study of physics upon mathematics that it is to be reckoned at once as a mathematical science, though, as will be seen later, physics has important aspects of educational worth not found in mathematics. With chemistry the dependence upon mathematics is much less, though here we have the laws of constant relations, multiple proportions, chemical formulas and equations. In history we have chronology; in sociology, statistics; in æsthetics, laws of proportion and sound; and in psychophysics, quantitative measurements of stimulus and response. High school algebra and geometry and trigonometry supply in large measure the quantitative laws which are applied in architecture, sculpture, engineering, military science, and navigation. It is through well-selected problems for solution that the student is made fully conscious of the intimate dependence of many pure and applied sciences upon the mathematics even of the high school; and this consciousness of practical worth often outweighs with the youth all the mental values of which he may hear, but of which he has no adequate conception."[2]

1 Charles De Garmo, "The Studies of the Secondary School," p. 65.
2 Ibid., p. 69.

Algebra

The science of number processes—Algebra may be defined as the science of number processes. As a science, it treats of abstract numbers, distinguished from arithmetic which deals with the application of numbers. It also deals with universalized numbers while arithmetic deals with what we may call particularized numbers. The latter is limited in its scope to particularized, applied, positive and rational numbers. The former is free of all limitations, and embraces all numbers and possible number processes. It may be defined as the science of universalized, positive and negative, rational and imaginary numbers. Algebra, on the other hand, is concerned with number processes and relations rather than with numbers as such. The algebraic expression, unlike the arithmetical expression, indicates a process to be performed rather than a result. This concept of number process as the central subject matter of algebra is essential for the teacher. It affords the effective point of view, the point of departure in algebraic thought.

The expression "a + b" represents primarily a process to be performed rather than a quantity, just as an equation indicates that if certain operations are performed, the results will be identical. "Zero" means the point of departure or the point from which one measures off a portion of an immeasurable series. The positive term directs that the measurement shall be made in one direction from this zero point, the negative term requires that it shall be made in

the opposite direction, and thus it is with the whole subject matter. Quantities are dealt with merely as involved in processes. Definitions and statements of principle best develop working concepts by offering their explanations in terms of processes. Algebra is abstract because the number process is considered as a fact in itself, apart from all applications to things. It is universalized not only in considering the series in both directions from the point of departure, but in proposing a situation which will be satisfied with any and all zero points. The process is universalized by the use of symbols which are good for any or all possible numerical values. It is this treatment of number processes in an abstract universalized relation which constitutes the essential characteristic of algebraic science, and makes it a science of thought rather than of things. It is this characteristic which makes it, as a subject of study, so difficult for the immature mind, and so likely to be poorly taught.

The objective in the study of algebra—The function of the study of algebra is to give facility in abstract or symbolized thinking. Its business is to afford the pupil experience in algebraic processes, which means experience in analytic-synthetic processes of thought with reference to an abstract universalized subject matter. So far as the subject is concerned, this objective is attained by making the pupil expert in the processes. In terms of pedagogical values, the aim is to habituate the pupil to the method of thought involved in algebraic processes, to raise him above the level of one-dimensional thinking, to free him from bondage to the here and the now, and from bondage

to things—to universalize his mind. Oliver Wendell Holmes has made the final distinction between the arithmetical and the algebraic mind. It is the latter which makes for real thinking and fits the individual for truly scientific effort. It is proper to claim for algebra that no other discipline of the school serves the same function. There is no substitute. The elimination of algebra as a pure science from the curriculum would cut the foundation from under all scientific procedure and deprive the individual of the only possible experience in that variety of thinking which is the essence of intellectual freedom and efficiency.

The first point of emphasis—The foregoing definition of algebra and of the objective of instruction in this branch of mathematics indicates where the emphasis shall be placed. It is necessary, as said above, that all algebraic ideas be presented in terms of processes or of indicated processes. It will be impossible for the student to proceed intelligently unless he gets an adequate mastery of the working concepts, as positive and negative quantities, zero, rational and imaginary numbers, the equation, ratio. These concepts must be made very clear to him; they must possess reality for him. They should be developed inductively from a wealth of concrete cases. All of the good texts will afford suggestions for effective lessons with this purpose in mind. Our object here is to emphasize the necessity of doing this part of the task well. If the pupil is given the proper conceptual basis of algebraic science, he will have little difficulty

with the subject, and besides will find it full of meaning and, therefore, of personal interest.

The second point of emphasis—A second feature to be emphasized is the performing of algebraic operations whether in abstract exercise material or in solution of problems. As a matter of convenience we may distinguish between pure and applied algebra, by the former meaning the discussion of principles and working of abstract exercises involving the operation of these principles, and by the latter meaning the problem material incorporated in the text for algebraic solution. As between the two kinds of material, the former—the formal exercises—deserves the greater emphasis because it frees the pupil's mind from concrete limitations and gives a purer exercise in algebraic thinking. Much more exercise also will be secured for the same reason.

The so-called applied algebra, as stated once before, is really for the most part an extension of arithmetic into the secondary school, and has little value for the pupil so far as obtaining the unknown number is concerned. As a rule, the equations are so simple that their solution is too easy to offer real mental exercise. The value is secured in the process of developing the equation.

Method of developing the equation—There are two methods of developing the equation:—

The Trial and Error Method.

The Analytic Method.

The former has no educational value and, therefore, should not be employed. It involves the symbolizing

of the "unknown" quantity and the combination and recombination of the "known" quantities into equations until one is found, the solution of which gives the desired result. The analytic method, as the term implies, employs the truly algebraic method of thought. In this mode of attack, the pupil first resolves the statement of the problem into its two or more comparisons of quantities. It uses one comparison for the purpose of symbolizing the several quantities involved in the situation. The other comparison, or comparisons, are converted into one or more equations, depending upon the nature of the problem, by merely restating the comparison in the symbolic language acquired from the first equation. To illustrate; in the problem,

"What are two numbers, one of which is twice the other, whose sum is 12?"

The situation alleged resolves itself into two statements or comparisons:

(1) One number equals twice the second,

(2) The sum of the two numbers equals 12.

Selecting (1) for the purpose of symbolizing the numbers we obtain the following:

(a) If we represent the first number by M, then the second will be represented by $\frac{1}{2}M$. Or,

(b) If we let M represent the second number, then the first number will be represented by $2M$.

Using the (2) for the equation and substituting the symbols in (a), we obtain

(c) $M + \frac{1}{2}M = 12$, or

$12 - M = \frac{1}{2}M$, or

$12 - \frac{1}{2}M = M$

Substituting the symbols in (b) we obtain

(d) $2M + M = 12$, or

$12 - 2M = M$, or

$12 - M = 2M$.

The pupil then solves for the numerical values of the symbols chosen. Since the pupil is working not for the two unknown numbers, but for experience in the resolution of problem situations and the development of equations, it is important to have him exhaust the possibilities of each problem. The amount of exercise and not the saving of time is of primary consideration.

Another illustration:

Problem:—"A man left an estate of $12,000 to be divided between his three sons in such amounts that the share of the second son was three-fourths that of his elder brother and three-fifths that of the younger. What did each receive?"

Analysis:

(1) The first statement gives the total of the three shares;

(2) The second statement compares the three shares; the second share $= \frac{3}{4}$ of the first and $\frac{3}{5}$ of the third.

Selecting (2) for symbolizing the shares and using the second as the basis of comparison, we obtain:

(a) Share of second son equals X

(b) Share of first son equals $\frac{4}{3}X$

(c) Share of third son equals $\frac{5}{3}X$.

Substituting these symbols in the first statement we obtain the equation:

$X + \frac{4}{3}X + \frac{5}{3}X = \$12{,}000$

or, using the first son's share as the basis of comparison we obtain:

(a) First son's share equals X
(b) Second's share equals $\frac{3}{4}X$
(c) Third son's share equals $\frac{5}{4}X$.

with the resulting equation:

$X + \frac{3}{4}X + \frac{5}{4}X = \$12{,}000$

or, using the younger son as the basis of comparison, we obtain:

(a) Third son's share equals X
(b) Second son's share equals $\frac{3}{5}X$
(c) First son's share equals $\frac{4}{5}X$.

with the resulting equation:

$A + \frac{3}{5}X + \frac{4}{5}X = \$12{,}000$

The pupil should be encouraged to seek out for himself these several methods of stating the equation. It is important also for him to understand clearly, in the preceding statements of symbols of the unknown quantities, that the word "equals" really means "is represented by," and does not express equality, and that the several symbols do not represent so many dollars but are verbal substitutes for the purpose of facilitating the thinking process. Nor is the 12000 so many dollars; it is an abstract expression. The concept "dollars" does not appear until the conclusion is reached.

Checking work—In the very beginning of the subject the pupil should be taught to check his work, and vigorously required thereafter to test the result of every solution. The independence of thought thus developed is invaluable. For this reason it is advis-

able that the textbook shall not contain answers, and that the use of answer-books be forbidden.

To summarize the foregoing discussion, algebra is an abstract science of number processes, universalized in content through the use of symbols which indicate the processes and relations considered. Chief emphasis should be placed on (1) the development of a proper conceptual basis, (2) practice in algebraic processes, (3) the algebraic solution of problems, involving

(a) Analysis of the situation into the sets of involved comparisons;

(b) Using one or more sets of these comparisons for deriving appropriate symbols of quantities;

(c) Using the remaining set or sets of comparisons to formulate equations;

(d) Testing results by appropriate checks.

Geometry

A pure science—Geometry in its present form is a pure science; that is, it is a body of truth which is acquired and communicated primarily for its own sake. Its significance for education is derived from the fact that it is the science of space, which is the universal language of scientific discrimination. As a "form of thought" the concept of space furnishes the ground of modern science; it supplies the form in which other scientific concepts are formulated and expressed. It provides the vocabulary for the expression of other sciences. In a sense, it is alphabetic in its relation to other sciences, and thus fundamental in

scientific training. All other sciences are conceived in terms of space, the subject matter of geometry.

The foundation of philosophical study laid—For this reason, the study of geometry has a high instrumental value in its preparation for the study of other sciences, particularly the physical and earth sciences. It also lays the foundation of all philosophical study. Its vocational value is small and its conventional worth but little greater. In common with all scientific studies, its liberalizing function is large. It is truly a cultural subject, although taking lower rank in this respect than the humanities. It is in the definiteness and supreme value of the discipline it gives that geometry is of most worth to the majority of its students. It affords the mind a specific training in logical processes. If properly taught, it develops the ability and habit of straight thinking, and in respect of this function it has no substitute. Geometry is supplementary to algebra in the discipline involved. It cannot be omitted from the secondary program without depriving the pupil of those concepts which are fundamental in science, and of the only definite experience in strictly logical procedure available in the high school.

Two objectives—The objectives in the teaching of geometry are two: the development of the space concept, and the training of the pupil in logical thinking. The first of these is accomplished through organizing the instruction to conform to the psychology of space ideas. The second end is secured through exercise in syllogistic reasoning. Our concept of space is derived from perception of its relational as-

pects as experienced in movement. Distance is conceived as the amount of movement from one point to another. Direction is movement this way and that. Infinity means that no limit has been found to our movement. This fact of the origin of our space concept in the experience of movement gives the point of departure in the development of spatial definitions. Hence, the best way of developing a geometrical fact is through movement. A line is a moving point. The plane is developed by a moving line. A solid is developed by a moving plane. An angle is developed by revolving a line about a fixed point as an axis.

Two principles of study—Geometry is a concrete universalized science. It is concrete from the fact that it always deals with a particular space which is definitely limited. It is universalized in the fact that the particular space considered is representative of any number of other particular spaces of which the characteristics named are true. The first of these principles requires that the pupil shall deal with a particular space definitely indicated in a perceived figure or as definitely conceived in his imagination. The second requires that at all times he shall recognize that the particular figure chosen is representative of an indefinite number of cases involving the same space facts. That is, the pupil must first see the space that is under discussion; not the lines which bound the space, but the space which is bounded by the lines. In the proposition "The sum of the interior angles of a triangle is equal to two right angles," the pupil must perceive a triangle, the three interior angles and the two right angles, and conceive the problem to re-

late to the equality of the sums of the two groups of angles. That is, he must see the three angles fitted together to coincide with two adjacent right angles. Unless the pupil's mind does thus concretely conceive the particular space under discussion his argument will be wholly barren of meaning for him. The failure of the school at this point completely destroys any possible value of the subject. The second requirement is no less vital. Unless the pupil realizes that the figure suggested by the teacher or textbook is only one of a countless possible number which will satisfy the conditions of the proposition equally well, he will miss the universal concept which gives the subject its scientific value.

The demonstration a process of logical thinking—These two principles constitute one of two conditions of effective teaching of geometry. The other condition is that the demonstration shall be a process of logical thinking and not a memory exercise. To cause or permit the pupil to memorize the model given in the book and to offer a repetition of this demonstration as a recitation exercise is an unpardonable waste of time and energy. If the pupil does not think out his proofs and give them syllogistic form he will get no discipline of thought whatever from the exercise. It probably would greatly facilitate the proper teaching of geometry if the textbooks omitted demonstrations altogether, presenting all exercises as original, or even if the textbook was entirely discarded. If the conventional textbook is in use, the best plan to follow will be to have the class work out the proofs in their own way, approximating the syllogistic form

as nearly as possible, and then compare the class effort with the finished argument in the text for confirmation or correction. The only proper employment of memory in a demonstration is in the recall of related facts which have been established in former exercises.

In order that the space facts already established shall be readily available in the discussion of a new proposition it is well to organize the accumulated knowledge by associating the related facts. Thus the class may be repeatedly asked to state all that has been learned about parallel lines, about triangles, about perpendicular lines, about circles.

The learning process involved in geometry—The mental process in a geometrical demonstration involves six steps:

1. Conceiving the figure, that is, the space to be considered as delineated in the figure.
2. Abstraction of a particular feature for consideration. The textbook ordinarily does this in the proposition submitted.
3. Analysis of the figure and related memories for suggestions as to proof.
4. Elimination of irrelevant facts and seizing of facts germane to the question at issue.
5. Synthesis of these elements to form a conclusion.
6. Arrangement of the several judgments in logical sequence leading up to the Q. E. D.

Illustration—An illustration of the treatment of a proposition: first of all, we suggest that the pupils do not procure their textbooks in plane geometry for the first month. To introduce the subject from the black-

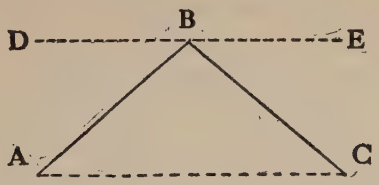
board will make it more certain that the pupils develop a proper habit of approach. Second, the teacher must remember that geometry is a concrete science in the sense that it deals at a given time with a definitely limited portion of space, and is universalized by keeping the pupil conscious of the fact that the particular portion of space under discussion is a type of an infinite number of cases.

In the study of the proposition,

"The sum of the interior angles of a triangle equals a straight angle or two right angles," the following is the form of analysis and synthesis to be employed;

1. What kind of figure is referred to? A triangle.
2. What kind of a triangle? Any.
3. And this means? Every triangle. All triangles.
4. In this proposition to what is referred, the sides of the triangle or the space bounded by the sides? The space contained within the lines.
5. What do you observe to be true of the triangle before you? (Of the space delimited.)
6. What assertion does the proposition make with reference to this space?
7. Is the statement true? Can you prove it?
8. Have you the two right angles for purpose of comparison? How will you procure them?
9. What methods of comparing angles have we discovered in former lessons? Which of these, if any, are applicable to this figure?
10. What changes in, or additions to the figure, do you suggest for purpose of comparison?

11. The pupil suggests the figure ABC with



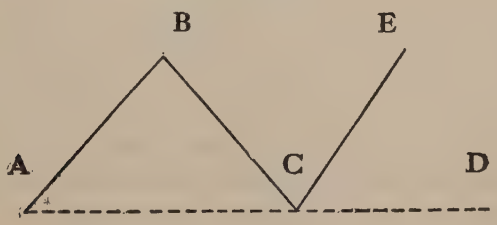
DE drawn parallel to AC through B, constructing a straight angle on the under side of DE and also producing a situation involving parallel lines cut by transversals.

12. In the above figure observe all of the comparisons which can be made. Quote authority for each judgment.

13. What synthesis can you make of these several judgments?

14. Is the construct DE the only one possible in this figure? Draw all other possible constructs which will satisfy the principle employed in proof.

15. Another pupil suggests a different modification of the figure: Extend AC producing the straight angle ACD on the upper side of the line and construct CE parallel to AB, creating a different situation involving the same relationships.



16. What other modifications of the figure may be made? The pupils make other drawings until the possibilities of the case are exhausted.

17. Examine your argument again. Is there any flaw in it? Any judgment which may be questioned? Any statement which may not be fortified by demonstrated facts?

18. Selecting any of the figures before you, arrange the several statements in your argument in progressive order leading without a break to your conclusion, referring at each step to the authority for your judgment.

19. Examine your argument to find whether your English is perfect; whether you have employed the right words, all that were needed, and none that were not needed.

20. Compare your demonstration with the proof given by your author. What do you find?

21. Restate all that you know about triangles.

The preceding plan of discussion involves the idea of the exhaustive treatment of each proposition. To many readers this may seem to demand too much time and attention to detail. But in the long run it will be found to be economical of time and energy. Besides, the object in the teaching of the subject is the development of logical ability, which requires the habit of exhaustive analysis as well as originality. Judd's definition in "Psychology of High School Subjects" gives a safe rule for guidance; "Geometry is rather the science of finding out all that can be discovered with regard to the characteristics of spatial

figures." The teacher should be patient, especially in the introduction of the subject. Here, as in other connections, he who is faithful over a few small things in the beginning will in due time be made ruler over the many and the larger.

Learning technical terms—It is quite essential that the pupils be trained to the proper use of the technical terms employed in geometry. These words express ideas which are vital to thought processes and which other words do not adequately express. Much confusion arises in the minds of the pupils because of carelessness in this respect. Such apparently familiar terms as *vertical, perpendicular, parallel, homologous, adjacent, interior, exterior, infinite,* are new to most of the class, and will seriously cripple the pupil's thinking unless their meanings are thoroughly mastered. The reader is referred to the discussion of this question in the chapter on English.

Practical applications—Some teachers have felt that there is a pedagogical necessity for making practical applications of geometrical knowledge. Considerable effort has been made in recent years to work out a practical geometry. But if we are correct in the assumption at the beginning of this discussion, that geometry as now organized is a pure science and its motive is purely intellectual, and, further, that its educational values are primarily disciplinary, we need not be disturbed by the modern demand for immediate utility. Smith thinks that the present movement "will not greatly change geometry, because no serious person ever believed that geometry was taught chiefly

for practical purposes, or was made more interesting or valuable through such a pretence."[1]

Observation of spatial figures—In a former paragraph considerable emphasis was placed on the direct observation of the characteristics of spatial figures as fundamental in accurate geometrical thinking. In plane geometry this is easily done, but in solid geometry a peculiar difficulty of many pupils must be overcome, namely their inability to "see" the solid. Two methods are employed to assist the pupil in overcoming this difficulty; the use of models, and of accurately made drawings. The problem is to develop the pupil's power of imagination, and the habit of using his imagination to embody the spatial facts under discussion. The following quotation from Schultze[2] with reference to the psychological problem of imagery presents the question clearly: "One difficulty, however, against which we must guard and which we must overcome at the very start is the inability of some students who are able to reason logically, but who cannot imagine clearly the spatial forms which the diagrams represent. There are two ways of overcoming this difficulty, namely, the use of models and rational methods of drawing.

Use of Models—"The function of the model is to help the student in the beginning to an understanding of solid figures in general, and to make clear to him, later on, difficult drawings which otherwise he would not understand. The model should, however, not be

[1] SMITH, DAVID S., "The Teaching of Geometry."

[2] SCHULTZE, ARTHUR, "The Teaching of Mathematics in Secondary Schools."—The Macmillan Co., New York.

used to supplant the drawing. As soon as the student is able to understand the drawings, the models should be discarded or reserved for the most difficult cases only. Otherwise the student will lose one of the main benefits of the study, namely, the development of his space imagination and of his faculty to understand diagrams of solids."[2]

Difficulties to overcome—The teacher will find three other types of difficulty to overcome, arising from the fact that there are three varieties of mental experience involved in geometry, and ordinarily in every demonstration, and that the pupil quite often gets lost in passing from one sphere to another. (1) The pupil frequently goes astray in not seeing clearly what is given, and what he has to prove. He sees the facts of the figure and is quite certain that they are true, but he cannot conceive a reason for their being true. He gets lost in passing from the perception of the spatial facts to logical demonstration of their necessity. (2) In the second place, he may readily conceive the reason for a fact and be able to state abstractly what the fact must be, but is unable to see the fact in the figure. He gets lost in passing from logical demonstration to observation and portrayal of facts in the figure. (3) The third difficulty is more perplexing to the teacher. It is involved in the case of the pupil who knows the rules of procedure in geometrical construction without knowing the reason therefor. It is the divorce of the practical mode of thinking from the theoretical. Professor Judd has

1 SCHULTZE, ARTHUR, "Teaching of Mathematics in Secondary Schools."

handled these situations so helpfully that his discussion is quoted at length: "How does imagery differ from reasoning? Why is it more difficult to imagine solid figures than to imagine planes? Is it true that one of the functions of geometry as taught in the schools is to cultivate the power of imagery? It is interesting to note that the experience of schools shows that students are deficient. Why should we be more deficient in these matters than the Greeks or the Japanese? Is it not because the school has left space to develop as best it can in the mind of the student without the legitimate help which would come from instruction in spatial relations all through the period of education prior to that in which the student encounters high-school geometry? If so fundamental a power as the interpretation of a drawing of a solid is lacking in high-school students, is it probable, in the light of experience, that a course in demonstrative geometry administered in the high school will cure the difficulty? Is it not rather the duty of the school to put into the elementary course at an early point, some constructive geometry? Indeed, it seems very clear to the unbiased student that it is to the interest of the geometrician himself that he be persuaded to look about for ways of cultivating space imagery which are more efficient than those afforded in the logical courses now offered in demonstrative geometry." [1]

Summary

The current confusion with regard to the place of mathematics in the secondary program is due, in part,

[1] CHARLES H. JUDD, "Psychology of High School Studies," p. 79.

to the inability of teachers to meet the demand that every subject in the curriculum shall justify itself, and, in part, to the admission of a large student body of the nonacademic type. Some are misled also by the notion that immediate utility is the only ground of admission of a subject to the curriculum.

Mathematics, with the exception of arithmetic, must be justified largely on other grounds than practical utility. The motive in arithmetic is vocational; the motive in algebra and geometry, historically and inherently, is scientific. The approach must be scientific.

A course in general mathematics is advised for the junior high school. In the senior high school the traditional specialized courses are more satisfactory.

Mathematical study has large disciplinary values but it is also necessary as an instrument in all scientific investigations.

The objective in algebra is to afford the pupil experience in algebraic processes, which means experience in analytic-synthetic processes of thought with reference to an abstract universalized subject matter.

The objective determines the point of emphasis, (1) working concepts, (2) the inductive approach, and (3) practice in algebraic processes.

Geometry lays the foundation for all philosophical study. Its objectives are (1) the development of the space concept and (2) the training of the pupil in logical thinking.

Two principles of study must be observed in geometry: (1) The pupil must deal in each instance with a definitely conceived particular space, and at the

same time (2) realize that this space is representative of an infinite number of other particular spaces involving the same space facts.

The demonstration is to be an exercise in logical thinking, and not a mere memory exercise.

Attention should be given to the organization of accumulated knowledge by associating the related facts.

The terminology of mathematics should be carefully taught as a means to clear thinking as well as to economy of time.

Geometry, as now organized, is a pure science, and its motive purely intellectual: we need not be disturbed by the recurrent demand for immediate utility.

A difficult function of the teacher of geometry is the development in his pupils of the power and the habit of using the imagination to embody the spatial facts under discussion.

References

ARCHIBALD, RAYMOND C. "Mathematical Instruction in France," Brown University, Providence.

BALL, WALTER W. R. "Short Account of the History of Mathematics," The Macmillan Co., New York.

DE MORGAN, AUGUSTUS. "On the Study and Difficulties of Mathematics," Open Court Publishing Co., Chicago.

EVANS, GEORGE W. "Teaching of High School Mathematics," Houghton Mifflin Co., Boston.

FINE, HENRY B. "The Number System of Algebra," D. C. Heath & Co., New York.

MANCHESTER, RAYMOND E. "Teaching of Mathematics," C. W. Bardeen, Syracuse.

MILLER, GEORGE A. "Historical Introduction to Mathematical Literature," The Macmillan Co., New York.

Monographs by the International Committee on Teaching Mathematics, U. S. Bureau of Education.

MYERS, GEORGE W., and others. "Teacher's Manual for First Year Mathematics," University of Chicago Press.

PEARSON, KARL. "The Grammar of Science," The Macmillan Co., New York.

RUNGE, CARL D. T. "Graphical Methods," Lemcke & Buechner, New York.

SCHULTZE, ARTHUR. "Teaching of Mathematics in Secondary Schools," The Macmillan Co., New York.

SKINNER, ERNEST B. "High School Course in Mathematics," University of Wisconsin, Madison, Wis.

SMITH, DAVID E. "Present Teaching of Mathematics in Germany," Teachers College, Columbia University, New York.

THORNDIKE, EDWARD L., and others. "Psychology of Algebra," The Macmillan Co., New York.

CHAPTER XIII

THE TEACHING OF PHYSICS

It was observed in the chapter on Educational Values that high school physics has certain preparatory functions. It was also suggested in the general discussion of science instruction that this subject logically comes first after mathematics in the sequence of science studies in the curriculum. Physics is necessary as a preparation for certain topics in chemistry, and quite essential to proper conceptions in astronomy, and in the biological and earth sciences. Ecological processes in plants and animals are largely mechanical, and require a knowledge of elementary principles of physics for their understanding. Likewise, in the case of the forces at work in the changing of land and water forms, and the action of air, water and heat. The study of physical geography and geology presupposes elementary physics. Its preparatory relation to mechanics and all branches of engineering is generally recognized.

Vocational value of physics is high—The vocational value of this subject is especially high. No other study in the high school curriculum, with the exception of English, has so much practical utility for all classes of people. With the increasing use of labor saving machinery, this utility is growing. The al-

most universal use of the telephone, of electric lighting and power, of automobiles, gas engines, lifting and force pumps, feeders, tedders, farm machinery of all kinds, individual and community water service, modern methods of house-heating and ventilation, and of the numerous mechanical devices for doing woman's work—all this enormous development in the industrial life of the people in country and city, on the farm and in the factory, is an application of the principles of physics to the essential work of the people. Clearly it is as necessary for the boy who wants to understand the mechanics and operation of this vast array of machinery, commonplace in modern life, to know the elements of physical science as for the reader of the daily newspaper to know his alphabet. Without a thorough grounding in the principles involved in the mechanical world, he is at the mercy of the repair man, and lacks the basis of knowledge necessary for efficiency in the use of these devices. This utility is so universal for boys that it would seem but the sensible thing to require all of them to pursue this subject one or two years. But the utility of physics is nearly, if not quite, as great for girls. The planning of the house, its lighting, heating, and ventilation, cannot be done intelligently without a knowledge of the principles of reflection and refraction of light, the phenomena of heat, of gases and fluids. The girl must know physics, if she is to be intelligent in the use of her camera, the care of her piano, starting a grate fire, turning on the electric light, using a flat-iron, drying her handkerchief, to say nothing of regulating the gas range, the sewing machine, driv-

ing the family car, or using the telephone. As a matter of fact, the practical applications of physics are as many and important in woman's life as in man's, and it would seem as sensible to require this study of all girls as well as of all boys.

The moral value in physics—The possibilities of moral education in the teaching of physics are so well stated in a paragraph by Dr. Frederick E. Kester that it is quoted in full: "Nor is the purely practical advantage, of which we hear so much in these days, obtained from knowledge of physical laws and principles through the better control of the physical phenomena surrounding us in every day life—through applications to engineering and to the industries—the only one worthy of notice. In common with all sciences the training in physics has moral values. It emphasizes the fact that truth only counts toward the building up of science; that falsehood not only is valueless in this regard, but positively harmful, since it requires frequently the expenditure of more energy to kill it than was used to put it into existence, so that there is the double waste of effort which, properly used at the start, would have brought us far along in the pursuit. There is also, I believe, a development of conscience to be got from the careful statement of exact laws, to be got as well from the careful manipulation of apparatus in our laboratories. It is, indeed, difficult to see how a student, if he has entered at all into the spirit of this science, can come away from the study of it without an increased appreciation of downright honesty."

It is evident that the application of the principles

of gases and fluids to the problems of house ventilation and sanitation, to the movements of the air, and particularly of heavy gases in city streets, may be made to contribute greater intelligence with regard to the public health.

Physics liberalizes the mind—The sentimental and reconstructive values of physics are very slight if at all appreciable, but the contribution of this study, when pursued in a masterly way, to the liberalizing of the mind is excelled by but one or two other studies, if by any. A mastery of the elementary facts and principles of mechanics, heat, light, fluids and electricity gives one the key to the understanding and control of his physical environment. Particularly is this true, if through proper field study and efficient laboratory practice, the individual has acquired skill in the handling of mechanical appliances and situations. After all, a man's feeling of self-confidence and his freedom in action are based on the sense of physical competency. The mastery of the mechanical environment greatly increases the man's physical competency, and, therefore, the forcefulness of his personality and the freedom of his activity. Looking at the matter from the strictly psychological point of view, this is one of the most valuable results of the study of physics.

The disciplinary values of high school physics, as in fact of all sciences, and for that matter of all studies, depend upon the method of teaching employed. If the subject is treated as so much material for a memory-cram, or if so presented as to fail to secure the self-activity of the pupil, the discipline afforded will be negligible. But if the teacher observes that

physics is both mathematical and experimental, and adapts her methods to conform to these characteristics, a discipline of the highest value may be realized. De Garmo has said: "Just as geometry may be developed from a few self-evident propositions, or axioms, so physics may start with facts lying within the immediate experience of the student, and enable him, step by step, to construct for himself through his own experiments and thinking a body of knowledge that is free from the uncertainties of opinion and authority. Here there need be no ballast of historical data, dogmas, doctrines, or exceptions." That is, if the student is led to observe the simple physical phenomena about him, to conceive them as problems to be solved, and through personal experimentation and rational thinking works out a solution which he personally checks up and establishes as a certainty, he will secure a strengthening of thinking ability, a more positive regard for truth, and the habits of analytic thinking and independent investigation. A year or two of such mental experience will have incalculable value. No other subject surpasses physics in the scope offered for practice in systematic original thinking and true student self-activity. In addition to these specific disciplines, there is the general balancing up of the effects of literary training. Helmholtz has emphasized this function in the following statement: "What has been noticeable in my experience with students who pass from literary schools to scientific and medical studies, is, first, a certain laxity in the application of laws that are universally valid. The grammatical rules upon which they have been

exercised are, in fact, accompanied by long lists of exceptions, and the students are consequently unaccustomed to trust to the certainty of the legitimate consequences of strictly universal laws. Second, I find them much inclined to rely upon authorities, even where they could form their own judgment. In philological studies, even the best of teachers refer students to authorities, because frequently they can not compass the whole subject, and because the decision often depends upon æsthetic feeling for beauty of expression, which demands long training. Both defects rest upon a certain inertia, indeed uncertainty of thinking, which will be injurious not alone in science studies. The best remedy for both defects lies in studies of a mathematical nature, for in them there is absolute certainty of reasoning, and no authority rules but that of the understanding itself.'' To this might be added that the problems of physics also tend to objectify thought, and that intelligent individual experimentation develops independence of thinking.

Professor C. R. Mann of the University of Chicago has this to say of the value of high school physics: ''Physics, as a subject for high school instruction, has a double advantage. It is not only so intimately related to the pupils' daily lives that they already possess a large range of concrete experiences on which to base their work, but it also is essentially a science of measurement capable of training the pupils in quantitative thinking and in appreciation of the value of definite, quantitative knowledge. It is both concrete and abstract, practical and theoretical. It therefore offers unlimited opportunity of training pupils in the methods

of thinking by which all real knowledge is obtained; and conversely of giving them greater control of their physical environment by teaching them how to apply the knowledge thus acquired to the world of practical affairs in which they live."

Teaching Objectives

In order to realize the educational values discussed above, the teacher should have the following objectives in view:

I. A body of knowledge comprising:

1. A clear grasp of the seven "ultimate concepts" that form the terms in which all physical phenomena are interpreted. These concepts are Space and Time, Mass and Inertia, Electricity and Ether, and Energy. All other concepts are reducible to these seven. The multiform happenings of our physical environment, whether in the field of invention or in nature at large, all are reducible in their interpretations into terms of these "ultimate concepts." It is clear then that they hold the key to the understanding of physical phenomena and must be thoroughly mastered.

2. The body of facts of the physical world, of the laws and principles governing the physical happenings about us, and constituting the body of "theoretical" physics. Particular emphasis should be placed on the quantitative determinations of these facts and principles.

3. The knowledge objective should include also

the applications of the principles learned in the classroom and laboratory, observed in the physical phenomena of nature and in the mechanical devices of modern life. Physics should help the pupil to understand his physical environment. The high school has too often failed at this point, which, after all, is the chief function of this subject. The course should be counted a failure which does not give the boy a knowledge of such matters as the municipal lighting, water, sanitary and heating systems of his home city; a knowledge of power machinery, systems of communication, devices for mechanical advantage. In fact, the information referred to under the first and second heads is desired primarily in order that the pupils may accomplish the results indicated in this paragraph.

4. In order to acquire a grasp of any subject of study or problem, it is necessary to see the subject or problem in its historical setting. It will add greatly to the interest of the pupils if they may have the essential facts in the development of physics as an individual science. Such information possibly should come late in the course, but should be given before the final summary is undertaken. Of much greater interest to the pupils, and of more value in their motivation for the subject, is the history of the application of the principles of physics in the invention of machinery. The history of the improvement of the steam engine, from its first form to the present, will add much to the pupil's zest for the study and also increase his insight into modern engine building. The

history of telegraphy, the telephone, the camera, the gas and electric motor, the electric light, is a fascinating study.

II. There are certain skills which form the second objective of the teacher. These are:

1. Skill in the analysis of physical problems, in determining the factors known and those to be discovered, and in finding a mode of attack. If the study of physics is to function educationally it must be scientific in its method. The teacher, then, must plan to train his pupils in the scientific approach to physical problems.

2. Skill in the devising and performing of appropriate experiments. Most teachers fail at this point in that they dictate the experiment, selecting the apparatus and directing the set-up, leaving the pupil nothing to do but go more or less mechanically through the manipulation of the apparatus and write up the notes. The only experimentation that has tangible value is that in which the pupil has developed a personal interest in a problem which he is determined to solve, and in which he plans and sets up the experiment that in his judgment will give the desired solution. The good teacher will plan to develop this variety of student-ability.

3. Skill in the manipulation of apparatus. That pupils need such training is obvious to any one who has observed their awkward attempts to handle strange devices. Most of the pupils, especially girls, come to the laboratory without any training in manipulation.

4. Accuracy of measurement. The average pupil

gets his first experience in accuracy in the physics laboratory. He was not born accurate, nor have his other studies, with the exception of mathematics if he has been fortunate in securing a good teacher, contributed anything to this virtue. He will require special training in measurements.

5. The fifth skill which the subject requires is in proper reporting or note-book work. For this too the pupil will require special training.

III. Emotional Experience. It would seem a strange failure at some point if the pupil should not receive a positive and unique emotional experience in the study of the subject which holds the key to the interpretation of physical nature and the inventive genius of man. Fiction has no romance so wonderful as the miracles of gravitation, electricity, and light. One must stand mute before scores of mechanisms which inventive genius has produced under the guidance of the physicist. Nothing in the humanities may stimulate the sense of wonder as do the daily lessons of the class in physics. The pupil whose teacher is philosopher and poet enough to open up the vision must daily exclaim "See what God hath wrought." Quoting from Dr. Kester: "Physics presents an admirably well organized form to the observer. That so great a part of the many and multiform physical happenings of our every-day life, whether they occur within doors or in the open, whether in the city or in the field, should be reducible in their interpretations to so few terms, is truly incitement to wonder and admiration. It is a point of view to which we should return again and again with our classes when we tire

of the detailed consideration of the laws of science."

The study of the genius of man displayed in his marvelous machines should excite equal wonder and admiration. There is a poetry in man's machines. A great locomotive engine speaks of vast power under control beyond portrayal in language forms. The great telescopes and radio-telegraphy annihilate time and space. The phonograph and the cinematograph almost reproduce life. It is a function of the teacher of physics to open up this world of beauty to his pupils.

And lastly a proper course in laboratory experimentation surely must quicken the conscience, the love of truth, of exactness. No other subject in the curriculum offers better opportunity for quickening those sentiments which lie back of the cardinal virtues.

Method of Teaching

In general the teaching process in physics should comprise:

1. The presentation of facts and principles through the consideration of *real problems* observed in the pupil's immediate environment. This step will involve (a) class discussion, and (b) experimentation, in the order named.

2. Class discussion of the problem and experimentation should be followed by the study of those portions of the textbook which bear on the facts and principles under consideration, together with quizzes on the content of the textual matter, the discussion and experiments, and the solution of the illustrative ex-

ercises presented in the textbooks and gathered from other sources.

3. The third step in the process is generalization in which the facts and principles are summarized and expressed in a formal statement.

4. Field work, in which the pupils apply their newly acquired information in the explanation of the phenomena of their immediate natural and mechanical environment.

Best method of teaching physics—If the study of physics is to realize the rich values possible, it should get as far as possible from the dogmatic mode of presentation of new knowledge to which the pupil has thus far been subjected in the elementary school and in the other studies in the high school. So far as possible the method of high school science, and particularly of high school physics, should be that of research. The teacher should regard the textbook not as the source of information, but rather as a manual and a means whereby the pupil may verify the conclusions at which he has arrived in the class discussion and his experimentation. It is also valuable for supplementing his insights by giving the formulæ and other results of research which are beyond his present powers and facilities. To assign portions of the text, whose content is to be memorized and reviewed in the class quiz one day and verified or illustrated in the laboratory exercise the next day, is a reversal of the normal mental process, and an inexcusable waste of educational values. It is recommended that a textbook be used in high school physics, if it is done without violating the fundamental principles of sound ped-

agogy; otherwise the pupils will be far better off without the book.

The normal procedure is to call attention to a phenomenon involving the fact or principle to be learned, which is readily observable in the immediate surroundings. By means of proper questioning, class discussion is aroused which leads to different suggestions as to the explanation, thus resulting in a problem which the pupils, if properly directed, are intent upon solving. The teacher should so guide the discussion leading up to the statement of the problem that further research will require the particular experiments necessary to a clear insight into the fact or principle which he desires to teach. With the problem thus stated and the pupils rightly motivated, the class then repairs to the laboratory to work out their proposed solutions. Each individual or group championing a particular theory should be required to devise the necessary experiment, making his own set-up as well as manipulating the apparatus. The teacher should confine his assistance to simple questions and suggestions that will prevent the pupils from wasted effort. The pupils should be led to criticize each other's work and arrive at an agreed statement of the results.

The second step in the teaching process is the study and discussion of those portions of the class text which present the fact or principle already discovered in the laboratory work, for the purpose of corroborating and reinforcing the information acquired. Thus the textbook serves the teacher as a manual or outline of the theory to be taught, and the pupil as a means of verifying his own investigations and filling out his con-

ceptions. The exercises given in the book will serve as further illustrations of the theory, and will develop skill in calculation. It may be necessary to resort to the laboratory to demonstrate the facts involved in some of these exercises. If so, the procedure should be the same as in the presentation step.

It is a serious blunder to allow a study to end without requiring the class to make a generalization of the knowledge which they have developed, and to express it in a formal statement. The clean-cut generalization is necessary to intelligent procedure in the study of the next topic, as well as to a proper mastery of the principles upon which the pupils have been working. The development by the class of an acceptable statement of the generalization is necessary to the retention of the newly acquired knowledge, and also to facility in its use. Many schools fail to give due emphasis to this step in the teaching process with the result that their pupils come out of the course with confused and loosely-organized concepts. Loose teaching is wholly wasteful. To fail to give the pupils a well-defined concept, expressed in proper language, is to sacrifice all of the possible values in the subject.

The fourth step in the process of teaching a given topic is to apply the newly-discovered principle to the explanation of the happenings and devices in the physical environment of the school, or in field work. The object of such field study is two-fold: Completing the learner's mastery of the topic by means of his handling of live illustrations; but more particularly the mastery of so much of the physical environment.

The emphasis of this phase of the lesson-whole should be sufficient to give the class a full understanding of all natural phenomena, machines, and processes which embody the principles in question. In this connection, the history of the discovery of this principle and of the development of its applications in human activities should be presented. Such historical study may take the form of talks by the teacher and of special reports by individual pupils. The high school library should be stocked with reference material suitable for this purpose.

The Experiment

From the foregoing it has been observed that we propose to make a radical change from the conventional place and function of laboratory work in the teaching of physics. Under the proposed organization of the teaching process the experiment is brought forward and employed as a means of developing the concept through problem-solving, instead of being used at the end of the lesson-whole merely for illustration of concepts developed dogmatically in textbook study and class quiz. The experiment is to be employed by the pupil as a means to the discovery of the principle rather than to illustrate it. It is involved in an inductive process rather than in a deductive process.

The organization of the experiment should be determined by the pupil, not by the teacher or a laboratory manual. It should not be a dictated exercise. The teacher's function is to advise, suggest and inspire,

rather than to direct. The initiative should be with the pupil. If he comes to the laboratory with a definite problem in his mind, and with a purpose to find a solution or demonstration of his theory of its solution, he will be sufficiently motivated to proceed on his own initiative.

Advantages of group work—Ordinarily group work in the laboratory is more profitable than individual experimentation. It is to be expected that the initial class discussion will divide the pupils into certain groups, each group taking a common point of view or championing the same hypothesis. Naturally such a group becomes the working unit. The purpose is a group rather than an individual purpose. The cause is social, and, as Judd has taught us, effective motive must be grounded in a social situation. Group work, in the majority of cases, is better than individual work for motivation.

Equipment—In most cases, schools are concerned about the equipment of the laboratory, often investing large sums in costly apparatus. The equipment is frequently so abundant and highly polished that the laboratory becomes the school's show-place rather than its workshop. In fitting up the laboratory the workshop idea should not be lost sight of. The very first equipment to procure is well-lighted work-tables, a set of tools, and a supply of materials out of which the pupils may construct much of the needed equipment. Pedagogically, it is more valuable for the students to make as much of the requisite apparatus as possible. The only reason for the purchase of ready-made equipment is the saving of time.

Special care should be taken to secure the highest possible degree of accuracy in measurements and in the making of records. Such care is necessary for the immediate success of the experimentation, and especially to the securing of one of the principal values of the subject. Slovenly work is a waste of time and labor. Precision cannot be too much emphasized. The pupils should also be taught methods of checking their calculations wherever such methods are applicable, and thereafter required to check all work before submitting results.

Notebook work—Notebook work is of enough importance to warrant the teacher's careful consideration. If the notes are confined to a description of the shop and manipulation of apparatus in a dictated experiment, the value derived will be very small indeed. If, however, the notes cover the lesson as a whole, as properly they should, they have an indispensable place in the teaching process. The record should contain a carefully-written account of each step in the learning process through which the pupil has gone, including:

The initial observation.
The problem suggested by this observation.
The hypotheses proposed.
The experiment performed.
    The set-up.
    The manipulation.
    The results.
The conclusions developed.

The additional information gleaned from the textbook.
The history of the topic.
The generalization.
Applications of the principle observed in the pupil's natural and mechanical environment.

It will be necessary, of course, to train the pupils to conciseness of statement, a virtue quite worth the necessary effort. The English values derived from such exercises are not to be despised. The chief values are clearness of conception resulting from the effort to produce a closely organized report, permanence of memory thereby secured, and especially the fixing of the habit of scientific thinking.

Summary

Considered with reference to the preparation it affords for the understanding of other subjects, its immediate practical applications, its cultural and disciplinary values, physics merits a prominent place in the study program.

The teaching objectives in this subject are: (1) Knowledge of the "seven ultimate concepts," the facts and principles constituting "theoretical physics," the physical phenomena of nature and of the mechanical devices of modern life, and the history of the development of physics and its application in the invention of machinery; (2) skill in the definition of problems, in experimentation, laboratory manipulation, meas-

urement and records; (3) an appropriate emotional experience.

The method employed should be inductive, comprising, in order, the following steps: (1) consideration of a *Real Problem* involving the facts and principles to be presented, including class discussion and experimentation; (2) consultation of textbooks, quizzes, and solution of illustrative exercises; (3) generalization; (4) field work.

The experiment should be used as a means to the discovery by the pupil of the fact or principle to be learned, not for the purpose of illustration or demonstration. The pupil should think out the "set-up" for himself.

Ordinarily group work in the laboratory is more profitable than individual experimentation.

In fitting up the laboratory, the workshop idea should not be lost sight of.

Very great care should be taken to secure the highest possible degree of accuracy in measurements and the making of records. Precision can not be too much emphasized.

References

Anderson, Frederick I. "Electricity for the Farm," The Macmillan Co., New York.

Duncan, Robert K. "The New Knowledge," A. S. Barnes & Co., New York.

Field, Henry M. "Story of the Atlantic Telegraph," Charles Scribner's Sons, New York.

Fournier d'Albe, Edmund E. "The Electron Theory," Longmans, Green & Co., New York.

HOPKINS, GEORGE M. "Experimental Science," Munn & Co., New York.

LODGE, SIR OLIVER J. "Pioneers of Science," The Macmillan Co., New York.

MILLIKAN, ROBERT A. "The Electron," University of Chicago Press.

WILLIAMS, HENRY SMITH. "Story of Nineteenth Century Science," Harpers, New York.

WITHAM, GEORGE S. "Recent Developments of Physical Science," Blakiston, New York.

CHAPTER XIV

THE TEACHING OF CHEMISTRY

Much that was said of the teaching of physics in the high school will apply equally to chemistry. De Garmo has said of this subject: "An examination into the nature of chemistry shows it to be an inductive science essentially non-mathematical, with a fascinating history and a marvelous utility in modern industry. It has been developed through countless experiments, and to be effective educationally must be taught in the same way."[1] In objectives and method it is closely allied with physics. Yet they differ in certain essentials.

Differences between physics and chemistry—Physics is mathematical; chemistry is largely non-mathematical, and because of the nature of the phenomena with which it deals is wholly a laboratory study. Physics deals with phenomena which are open to observation on every hand in the natural and mechanical environments of the pupil. Chemistry deals with happenings which are not thus open to observation. These activities must be artificially produced in order to be available for study. Again, chemical changes take place in the functioning of atoms and molecules, which cannot be observed by the senses; hence, these changes when artificially produced cannot be apprehended by

[1] CHARLES DE GARMO, "The Studies of the Secondary School," p. 77.

direct observation. They can be known only through inference from established data. The study necessarily, therefore, is a laboratory subject, and requires the highest order of scientific thinking.

Chemistry, also, is somewhat more closely identified with technology than is physics, and for this reason has a stronger attraction for those of a practical disposition.

Educational Values

Chemistry is a prerequisite for anything more than a merely superficial study of the biological sciences; for engineering, medicine, scientific agriculture, home economics, sanitary science, the earth sciences, and for most forms of technical education. This preparatory function is so significant that chemistry is generally prescribed as a preliminary to all sciences and technical courses.

The practical value of chemistry—The practical value of the subject is beyond measure. Its utility is well stated by Prof. J. E. Mills: "Chemistry in the high school should be made a wonderfully interesting study and a study that would contribute a lasting interest to life; but this is only one part of the story. Each man's present life, as he lives it under the conditions of our modern civilization, has been made possible only by the knowledge of chemistry which the world has come to possess. A knowledge of chemistry has made possible the production of iron from its ores, and every step of civilization has been dependent upon that knowledge. But that industry is

only one of a hundred industries dependent upon a knowledge of chemistry for their existence or for their present perfection. The production of copper and silver and lead and tin and zinc from their ores, and the winning of gold, are dependent upon chemical processes. The chemist explains how best to produce brick, and cement, and mortar, and concrete, for the purpose in view. He supervises the manufacture of glass, of paints, and dyestuffs. He is a necessary adjunct to the sugar refinery and to the soap factory. Not alone for the material of the printing-press, but for the paper and the ink as well, a debt is owing to the chemist. He aids the physician with his drugs and the farmer with his fertilizers. To his care is largely entrusted the carrying out of the pure-food law and the inspection of drinking water. The above are only examples. Literally in a hundred ways the knowledge of the chemist touches the home life of nearly every man, woman, and child in the United States. All of the chemical processes mentioned, and the numerous others, can be taught in no high school. But a foundation for further reading can and should be laid, and some of the simpler, and locally more important, processes should be taught." To quote once more from De Garmo: "A mere glimpse at the function of chemistry in industrial life shows its immense practical importance; chemistry of iron and steel; reduction of ores, refining of oil and sugar; manufacturing of dyes, starch, beer, wines, gas, paper, leather, lime, cement, soap, fertilizers, extracts; the proper nourishment of the human body, care of health, disinfectants, sanitation; to say nothing of its first great

function after the attempts at transmutation were given up, namely, the production of medicines."

It is obvious that even an elementary knowledge of chemistry is of great value in protecting health. It enables one to understand the many bulletins conveying information with regard to sanitation, pure and impure foods, drug adulteration, patent medicines, insecticides, disinfectants, and the physiological processes of nutrition of the human body and elimination of body wastes.

Its cultural values—While chemistry is not ordinarily considered a cultural subject, yet in the hands of a capable teacher whose insight reaches beyond the mere factual material, this study should stimulate the pupil's sense of wonder to romantic heights. In company with all of the sciences, chemistry reveals marvels far beyond the imaginings of romance. It is said that fact is stranger than fiction; certainly it is more wonderful. Chemistry affords the opportunity for a genuine and characteristic emotional experience.

Its disciplinary values—In disciplinary values chemistry is unsurpassed as from the first lesson it requires the highest kind of thinking. Its procedure is scientific from the beginning; its method is that of the research laboratory, which calls for the highest order of application and logical analysis. The pupil must learn to think or he gets nowhere. It therefore calls out all of the student's potential ability. It also develops in him the qualities of thoroughness, perseverance, patience, accuracy. It inculcates the scientific attitude and fixes in the pupil the inductive habit of thought. "It necessitates at almost every step rea-

soning from things seen to things unseen, and from particular facts to general laws. It cultivates the scientific use of the imagination. It gives the student opportunity to apply his knowledge of mathematics, English and drawing. It gives him skill in the use of apparatus and fits him for further similar work later. It develops accuracy, self-dependence, and intellectual honesty. It furnishes him an insight into —nay, more, it even introduces him personally to the methods that have been and that are used in the study of nature and natural laws. It encourages his innate desire to ask questions and teaches that lesson which it took the human race many centuries to learn—that the questions must be asked, not of men, nor of books, but of the things themselves."

The Teaching Objectives

The objectives of the course in high school chemistry may be shown in outline as follows:

I. Knowledge.
   1. A general view of chemical science—its primary laws and theories.
   2. A body of practical information with reference to the composition of substances commonplace in the lives of the pupils, and the chemical changes occurring in familiar household and industrial processes, leading up to a comprehension of the industrial application of chemical science.
   3. An insight into the logical procedures in chemical research.

4. The history of the science of chemistry, especially the history of the discovery of the primary facts and laws.

II. Skills developed.
   1. Laboratory manipulation.
   2. The art of inductive thinking.

III. Emotional experience.
   1. Appreciation of the wonders of the physical world.
   2. Enthusiasm for the subject.

Obviously it is impossible in a high school course to cover the entire subject, or, because of the immaturity of students, to go into quantitative analysis and the more technical developments of the subject profitably. If chemistry is taught as a "memory" study by the "textbook method," it will have little value. It is inherently a laboratory study, and its method is the highest form of inductive thinking demanded of the pupil. This means that the study cannot be taken up profitably below the junior or senior years. Not more than two years' work should be undertaken. The effort should, therefore, be directed toward giving the pupil, first of all, a group of those facts and theories which are alphabetic in chemical science—the primary facts, principles and theories. It is recommended that the effort be confined to a smaller scope of study with greater stress upon the quality of the pupil's work. Whatever is undertaken should be mastered perfectly.

One of the principal objects of science study is to give the pupil an acquaintance with his physical en-

vironment, and the ability to interpret its phenomena. One of the important functions of high school chemistry is to give the pupil an understanding of the composition of those substances which he constantly uses, and of the chemical properties and processes involved in his domestic and industrial environment. Therefore, a considerable portion of the time granted to the subject should be devoted to the composition of water, air, soils, rocks, sugar, salt, goods, fertilizers, paints, patent medicines, preservatives, insecticides, disinfectants, etc., and to the chemical processes involved in dairying, removing stains, antidotes for poisons, the reduction of ores, the production of steel, the refining of oil, sanitation, the production of gas, the refinement of sugar, the manufacture of dyes, starch, gas, paper, leather, rubber goods, lime, cement, soap and extracts, and the chemical changes which take place in the physiological processes of the body.

Student must understand method of research—It is necessary that the student of chemistry acquire a clear conception of the several methods of research. It is impossible for him to make any headway unless he does so. The several methods of Difference and Agreement, of Concomitant Variation, and of Residues, he will need to employ on different occasions, and unless he understands the logic of such processes his experimentation will lack a definiteness and certainty which it is sure to possess if he is able to proceed from step to step with a consciousness of the procedure as a whole.

The discussion of the relation of the history of physics, in connection with the study of that subject, ap-

plies equally to the teaching of chemistry. The development of the subject fact by fact, and theory by theory, from its beginnings in the ancient gropings of alchemy forms a most interesting and inspiring story. It makes the student at home with the subject. He feels as though he had grown up with it.

The attention of the teacher should be given to the development of two skills: the manipulation of apparatus, and the use of the inductive process. The pupil stands in need of training for both. Much of the blundering, the waste of time, the confusion, and the breakage, might be obviated by a few lessons devoted exclusively to manipulation and care of apparatus and materials. There is even greater need of careful supervision of the thinking process of pupils. They will need training in proper sequence: observation, hypothesis and verification. And in each of these steps in the inductive process they will need guidance until they are safely independent.

As indicated in a preceding paragraph the variety of study which is here outlined under the hand of a live teacher, possessing insight into the infinite relationships of the world of matter, should give the pupil two emotional experiences. He should feel a lively appreciation of the wonders which God has wrought in the nature of things. The world should be to him a myriad of miracles, the mystery increasing with acquaintance. It should become sacred to him, speaking in unmistakable language of the power and workmanship of the Creator. At the same time, the student should develop an ardent enthusiasm for the subject. Its fascination should fill him with a

passion for research. These attitudes toward the subject may prove to be the most profitable results of the course.

The Teaching Process

As in physics the teaching process comprises the following steps: Observation, Hypothesis, Verification, History, and Application.

Chemistry should follow the inductive process—This is the inductive process. The lesson properly begins in the laboratory rather than in the lecture-room. The first step is the production by the teacher of a fact which stimulates the desire for an explanation. The observation of the fact, together with all of the conditions present, is followed by the question as to the cause of the situation, which constitutes the problem to be solved. The pupils are led by suggestion and questioning to propose possible explanations. These are the hypotheses advanced as a basis of investigation. The class should, at first, take the several hypotheses one at a time and discuss the possible methods of verification. Having determined upon the one which appears most feasible, they will proceed to set up and perform the experiment. The results should be discussed to discover the reasons for the success or failure of the experiment. In like manner, the several hypotheses should be disposed of until all suggestions have been exhausted. This should be conducted in the beginning of the course as a class exercise, members of the class proposing hypotheses, and handling the experiment. The teacher should be

the guide. His primary objective will be to train the pupils in scientific procedure. After all members of the class have grasped the method of research, they may work in groups, each group undertaking the verification of a single hypothesis, and reporting results with discussion of its experiment to the class as a whole.

The experimentation should be followed by the study of that portion of the text bearing upon the question under discussion, and by any lecture-material which the instructor has to present. In connection with the presentation of the textual and lecture-material, the history of the discovery of the fact would properly be given. The historical data may be presented by the instructor, or be secured by the pupils from the reference books to which they should have access.

The last step in the teaching process is the application of the newly acquired information to the explanation of the chemical facts and processes of practical interest which involve the principles that have been under investigation.

Such a lesson, beginning with the careful observation of selected facts, and following in order the formulation of hypotheses, their verification first by experiment and then by authority, the history of the discovery of the fact, and its utility in the industrial and domestic life of the pupils, affords a magnificent discipline in initiative, logical thinking, cultural contemplation and practical application. It is a discipline which surpasses anything else offered in the curriculum.

It may be helpful to call attention again to the place given to the lecture, textbook, quiz, and laboratory exercise in the above lesson plan. The teacher must bear in mind that chemistry in its very nature is a laboratory subject, and must be pursued inductively. This means that the laboratory exercise for the most part is not a demonstration or practice-exercise to illustrate facts and principles learned from the textbook or lecture, but an exercise in which the pupil is endeavoring to discover the truth for himself. Considerable information must be given dogmatically as a matter of expediency, but it should be the constant ambition of the teacher to do as little dogmatic teaching as possible. His ambition should be to make the laboratory exercise a truly research exercise. The lecture and textbook study should follow, not precede the laboratory exercise, and with the purpose of supplementing and further verifying the conclusions which the pupil has drawn from his experimentation. The place of the quiz is at the end of the lesson and later at intervals, for the purpose of reviewing and fixing the acquired information accurately and firmly in mind.

A very good example of this method of procedure is taken from De Garmo's "The Studies of the Secondary School": "A concrete problem taken from elementary chemistry will suffice to show the kind of mental activity involved in chemical experimentation. Suppose the problem is to find the cause of the formation of the ash-like substance seen upon the surface of base metals when they are heated.

"The first thing to do is to heat the metal or metals

in an open retort, when observation quickly shows the 'ash.' It will conduce not a little to the student's interest to learn that many centuries had to pass before man learned the true cause. An explanation of scientific method (observation, hypothesis, and verification) will prepare for the solution of this problem, and show the worth of exact and complete, and the worthlessness of inexact and incomplete observation. Since a knowledge of the truth can be adequately obtained only through the student's own thought, he is asked to propose a hypothesis as to the cause of this ash-forming seen on heated metals. Of course it will occur to him that the heat is a cause, but he will suspect that it is not the only one. It will easily occur to him that the air is present, and may perhaps be excluded. The teacher may suggest that it be displaced by hydrogen, which for the present is to be considered merely as a means for excluding the air. If now, the heated metal remains untarnished in a stream of hydrogen, and the student is convinced that the air has something to do with the corroding of the metal, it is certain that this conviction will be confirmed and strengthened when he sees that with the return of the air the familiar color reappears on the heated metal. Even if it now seems to be proved that without the presence of the air the metal cannot change, that therefore the air exerts a direct influence in the change, yet the nature of this influence is still unknown. Further experiments (lessening of the column of air and changes in it caused by contact with the hot metal and increase in weight of the latter) lead the student through similar metal processes

to be certain that the so-called 'ashes' on the hot metals are nothing more than combinations of the latter with that part of the air which, without knowing what it is, one may say with confidence is the part that is most active in the burning of combustible bodies. The production of oxygen out of oxide of mercury, which immediately follows, brings this series of experiments to a close. Here follows naturally a glimpse over the history of this discovery: Knowledge of the ancients about 'ashes' later called 'lime' as well as the erroneous views of the nature of metals and their 'ashes' during the middle ages and later times, from Geber (800) to Stahl (1697); the complete overlooking of the influence of air and the consequent erroneous view that the cause of the corrosion lay in the metals themselves, and that consequently they might be changed to precious metals (the efforts to change base metals into gold lasted for 1,500 years); the proposal of the phlogiston theory, which, though recognizing the 'calcifying' influence of the air, fell into another error by failing properly to observe the change of weight in the latter and the final elimination of this error by Lavoisier."

The teacher should not be too greatly discouraged by the meagerness of his laboratory equipment. The discussion of the physics laboratory will apply equally well to chemistry. A full equipment will expedite experimentation in a way; and yet there are certain disciplinary and cultural advantages derived from the necessity of calling out the ingenuity of pupils. Many of the great discoveries in chemical science were made

in laboratories which would appear extremely barren of equipment to the modern teacher.

The reader is also referred to the discussion of the place of the laboratory notebook in the chapter on physics. The observations in that connection have the same value in this.

Summary

Chemistry is inherently a laboratory study, and for this reason affords a variety of training not to be secured from any other subject. Like physics it is rich in educational values.

The teaching objectives are: (1) knowledge of general chemical science, practical information with reference to the chemistry of familiar things and processes, an insight into the method of chemical research, and the history of the science of chemistry; (2) skill in laboratory manipulation and the art of inductive thinking; (3) appreciation of the wonders of the physical world and enthusiasm for the subject.

The teaching process involves the following steps in order: observation, hypothesis, verification, history, application. The inductive method is employed.

The same conditions as to pupil-initiative, group-experimentation, careful generalization, and accuracy of record required in physics, will apply in chemistry.

Greater emphasis than ordinarily is given should be devoted to the chemical interpretation of the pupils' environment. A considerable proportion of the allotted time should be given to the composition of

water, air, soils, rocks, sugar, salt, paints, preservatives, etc., and to the chemical processes involved in dairying, reduction of ores, removal of stains, etc., together with the chemical changes which take place in the human body.

The teacher should strive to arouse a real enthusiasm for the subject. Much should be made of the emotional experiences possible in chemistry.

References

Bailey, Edgar H. S. "Textbook of Sanitary and Applied Chemistry," The Macmillan Co., New York.

Bulletins of U. S. Department of Agriculture.

Cohn, Dr. Lassar. "Chemistry in Daily Life," J. B. Lippincott Co., Philadelphia.

Dodd, Margaret E. "Chemistry of the Household," American School of Home Economics, Chicago.

Duncan, Robert K. "Chemistry of Commerce," Harper & Bros., New York.

King, Franklin H. "The Soil: Nature Relations, and Fundamental Principles of Management," The Macmillan Co., New York.

Phillip, James C. "Romance of Modern Chemistry," J. B. Lippincott Co., Philadelphia.

School Science and Mathematics, 1910, 1908, and 1909.

Slosson, Edwin E. "Creative Chemistry," The Century Co., New York.

Smith, Alexander, and Hall, Edwin H. "The Teaching of Chemistry and Physics in Secondary Schools," Longmans, Green & Co., New York.

CHAPTER XV

THE TEACHING OF BIOLOGY

The biological sciences constitute the second division of the natural sciences, and include the following special subjects: General Biology, Botany, Zoology, Physiology and Hygiene, Embryology, Histology, Anatomy, Economic Botany, Economic Zoölogy, etc.

In addition, several of these subjects are further specialized. The biological sciences differ from the exact sciences of physics, chemistry and mathematics, with reference to both subject matter and method. Biology is not an exact science, for the reason that it deals with the most incalculable factor which man has undertaken to investigate, namely, Life. Biology is the science of the phenomena of propagation, nutrition, growth, organic function, development of species, adaptation to environment—the various phenomena which constitute the functional aspects of the unknowable thing we call life. These phenomena may be observed, catalogued, classified; type structures and processes noted; uniformities formulated; and still at every point the student meets the impossibility of making definite distinctions, and of predicting positively the processes which will ensue from any given set of conditions. The laws of physics and chemistry may be stated with apodictic certainty; there is no

variableness, and therefore no need of exceptions or reservations. But the laws of biology admit of no such assurance. Variation is the rule rather than the exception. The "laws" of habit, instinct, heredity, generation of species, adaption to environment, are not more than tendencies—"central tendencies" they might well be called—from which variations in all directions must be recognized. It is a rule of surgery to expect a given structure to conform to the location and form described in the books in about forty per cent of the cases. In six cases out of ten it will be more or less out of position or will vary more or less from the type form. There is always this fringe of variants surrounding the phenomena which conform to the "central tendency," the performances of which can not be calculated. We are all familiar with the adage: "One man's meat is another man's poison." The physician does not venture to predict the reaction of a particular stomach to a particular remedy. All of his cases are "individual." The "individual case" is characteristic of biological science. No "two black-eyed peas" ever were exactly alike or behaved in exactly the same way.

Besides the element of capriciousness which makes the organic world so incalculable, there is also an element of mystery in all living things which makes the world a great wonderland. As wonderful as are the marvels of mechanical phenomena, they fall far short of the wonders of Life itself in its mysterious nature and its marvelous manifestations of energy and resource. Biology portrays to the student the world's eternal, incomprehensible and ever-changing romance. He

finds himself revealed in a thousand forms and tricks of life about him. Through the creatures of earth and water and air he comes into vital touch with the Creator. The world of living things is to him a great mirror which reflects back to him the dual mysteries of human experience, man's own nature and the nature of God.

> "To him who in the love of Nature holds
> Communion with her visible forms, she speaks
> A various language."

The phenomena of reproduction, growth, nutrition, generation of species, and organic functions—the essential factors in the world of living things and, therefore, in the life of man, are confined to the field of biology. Another element of subject matter peculiar to biological study is the inter-relations of creatures: of animal and plant life, of certain plant forms and certain other plant forms, of certain animals and other animal types on which they depend. These interdependencies are most significant. Besides, there are the correlative adaptations: the adaptations of living organisms to physical environment, and of structures and functions in a given organism, to balance up properly some new modification of structure or function. Such studies result in insights into functional relations, the chapter which brings the student nearest to an understanding of the mystery of life.

Of the phenomena of life, birth, growth, death, adjustment, the physicist and chemist know nothing. These facts and relations are entirely outside the province of the exact sciences. Obviously, the biologi-

cal sciences are essential to an understanding of the world in which we live and to an understanding of ourselves as living in the world. They become, then, very important in the course of study. The curriculum which omitted biology would be grievously imperfect and inadequate. There can be no acceptable substitutions for biological science in the system of instruction.

The study of biology begins in the field—The method employed in biological science in its general and elementary aspects is the simplest form of induction. Induction *per Enumerationem,* involving (1) first of all, observation of individual cases in their natural relationships and engaged in their normal functions. This observation should be extensive and accurate, should be sufficiently extensive to give the pupil a real working knowledge of his field, and sufficiently accurate to discover and report the facts. The good teacher will insist upon both requirements: that the student secure a wealth of data by first-hand acquaintance, and that he train himself to the point of reliability in observation and report. The success of biology teaching is determined at this point. Failure is due most commonly to the acquisition of an inadequate factual basis for generalization, with the result that the generalizations lack real meaning and validity. There are three or four principles of teaching which should be noted in this connection. First, biological study is properly a field study, not a laboratory subject, particularly in its elementary phases. The place to begin is in the outdoors. The study of botany should begin in the meadows and woodlands

and along the highways. Its first step is to get a personal acquaintance with the plants of the region in which the pupil lives—their structural characteristics; their habitat; their plant, animal and human associations; their adaptations to their environments; their food; their enemies; their economic uses and æsthetic quality—and to get this personal acquaintance by companionship with them where they are rooted and at work on their job. The proper beginnings of zoölogy are similar. The real zoölogist began as a companion of birds and insects and other creatures. He collected and followed and looked and listened. He gathered a vast fund of knowledge of individual cases. He learned how this and that and the other creature lives—what it eats, how it fights, what it fears, how it hides, how it has fun, where it lives, how long it lives, its family life, its associations. If a pupil can be led to acquire a wealth of such information, he will possess an adequate basis for trustworthy generalization. The first principle is that the study of biology must begin in the field, and should very largely remain there, and that it should be extensive.

Creatures must be studied in their relationships—A second principle is that creatures, both plant and animal, should be studied in their relationships. No animal lives unto himself. In a very real sense, its situation is a part of its life. In other words the relationships of a creature to its environment are a part of it as a living thing and must be included in a study of it. Not only structural characteristics and protective features are understood in connection with

the environment to which it is adjusted, but its organic functions are similarly determined. The squirrel in the cage is not the real squirrel; he is less than the clever, active, and wonderfully-equipped citizen of the oak tree. Much less does the dead specimen or the stuffed skin tell the truth about squirrels. Observation should be directed to the creature in action, and to its relationships to the situation of which it is a part.

Biological study requires time—A third principle is that observation of the type described above requires time. It requires, in fact, that the young naturalist shall extend his field work over several years and through all seasons. Biology differs in this particular from all other science studies. A rather complete study may be made of elementary physics in the school year, and without regard to season. But not so in biology. Educators are coming to see that the biological instruction of the schools should extend through several consecutive years of the elementary and high schools under the direction of one person, the best years perhaps being from about the fourth to the tenth school years, and if possible the direction should apply especially to the summer months. With four or five years of carefully and enthusiastically directed field work in the elementary school as a basis for high school instruction, it would be possible to devote the allotted time in the latter to organization of material, to generalization of field experience, and to the investigation of special problems of structure and function.

Emphasis should be placed on how creatures live—A

fourth principle is involved in all of the foregoing; namely, that the emphasis in teaching biology should be placed on how the creature lives, or on its vital activities, rather than upon structure and morphology. That is, problems such as structure and accommodation should be interpreted through the ecological relations of the creature. This again emphasizes the relative importance of field work. The laboratory and the microscope should be the last resort of the teacher of biology. After the eye has exhausted its possibilities, the hand lens may properly be taken up, and not until the hand lens has been exhausted should the microscope be introduced.

Accuracy of observation is required—The second requirement of the observational phase of biological study is accuracy: Accuracy in seeing the facts, and accuracy in telling what is seen. This is an art which all students must acquire. It is not inborn. It requires long and sedulous training to make the normal youth see and tell the "truth, the whole truth and nothing but the truth." First of all, he must acquire the power of emptying his mind of all fancies and preconceptions. It is a trick of the eyes to seem to see what the memory has stored away from reading and kindergarten tales. The mind instinctively seeks to confirm its anticipations. It is also a trick of the eyes to seem to see one's self in every other creature. The boy is a more or less rational person, and tends to let this characteristic color his observation. He is conscious of certain mental processes in connection with certain activities. He observes what he takes to be the same activities on the part of animals and

naturally infers that the animal experiences the same mental processes which were involved, or which he thinks were involved, in his own experience. And so he tends to go about clothing the wild folk with his own mental life. Nature literature is filled with such fallacious observations of men who enjoy good reputations, but who are grossly deceived by the reflections of themselves in the wild life they are trying to portray. It is no easy matter to relieve the mind of the biases of memory and of the personal equation, yet it is precisely this which the student of biology must accomplish or his studies will degenerate into the pursuit of fairies. That is, there can properly be no difference between the method of teaching elementary biology and the method of biological discovery. If biological instruction is not scientific in its spirit and method, it loses all reason for a place in the course of instruction.

Danger of hasty inferences—The student must also learn to protect himself against the very natural tendency to accept the suggestions of his first view as the facts in the case. This is another trick of the mind which is the source of endless confusion and misinformation. He sees a particular movement on the part of an animal which suggests that certain other movements will follow. The temptation is strong to infer that such movements did occur, and to feel entirely certain that one really did see what he merely inferred. Inference necessarily is the large factor in observation; the problem is not to eliminate the element of inference, but to cultivate the habit of checking up these suggestions by following the crea-

ture through all of its movements, or by repeating the observation on the same or other creatures many times on different occasions and under different circumstances. The student should be trained to be critical toward his observations, unwilling to accept any conclusions as true until the accumulated evidence leaves no ground for reasonable doubt.

Carelessness in reporting—Again, carelessness in reporting is a prolific source of error. The enthusiasm of discovery and the instinct for "the finished story," combine to sweep the young naturalist off his feet and make him unconsciously tell more than he saw, or shade his report to give an account which satisfies his desire for completeness. Much attention should be given to the proper training of the pupil in this respect. He should learn to exercise due restraint of his literary impulse, to be modest of statement, to "tell the truth, the whole truth and nothing but the truth." It is entirely a matter of training, but one which will require painstaking practice. Imagination is an invaluable part of the naturalist's equipment, and the great outdoors is full of the liveliest romance, but the youthful explorer must confine his imagination to the limits of ascertained truth, and he must learn that facts are more romantic than the creations of his own fancy. It is important also to habituate pupils to making copious notes in the field. Memory is a treacherous servant, and the student should early learn to be sceptical of its contents. The notebook should go with field-glass, camera and collecting-can.

The first step in the inductive process employed in biological study, as indicated in the preceding para-

graphs, is in the painstaking observation of the largest possible number of individual cases. The second step is generalization; the organization of this mass of information into concepts of kinship, and of biological conditions and processes. As already suggested, the problem is not so much to secure generalizations on the part of the student as it is to induce him to defer such step until a sufficient mass of accurately established data is available to warrant a conclusion.

Generalizations: systematic and functional—The generalizations of biology are of two kinds: first, those relating to the identity or kinship of individuals, to their place in the animal or plant series; second, concepts of anatomical, morphological, ecological and economic relations, conditions and processes, etc., or what may be called the "principles of biology." The first type of study has been called "Systematic," the second, "Functional." The former results in a classification of the animal and plant kingdoms; the latter in an organized view of life processes and conditions.

Two things should be said in this connection. Historically, the first type of generalization came first and for many years monopolized the thought of the student. Later, the second type appeared and at once displaced the former, but properly both types of study are necessary. The so-called "systematic studies" logically precede the "functional" studies Not only do they require the organization of one variety of observational material, and that the data

necessarily be first established, but they also supply the student with essential data for the second type of generalization. Both logically and psychologically the "systematic" concepts must precede the concepts of functions and cannot be omitted without fatal damage to the latter generalizations.

Student should be trained in process of generalization—The second remark suggested at this point is that the student should be definitely trained in the process of generalization. The reader is referred to the discussion of this topic in an early chapter, and particularly to the illustrations of the processes of abstraction, analysis, and synthesis drawn from the field of biology. It is sufficient in the present connection to remind the teacher that the process of generalization is itself a complex movement involving the steps of abstraction, comparison, judgment and verification, and to urge that the pupil be trained to follow the movement through systematically. It is as necessary to organize and properly assimilate data as to secure them in the first instance. Attention is again called to the suggestion that this second step be presented to the pupil in the form of problems which require the necessary classification of accumulated data, abstraction of particular features as bases of comparisons, and the resultant findings, with the necessity, frequently, of further exploration afield or of experimentation in the laboratory and readings in the library. A careful restudy of that portion of Chapter III relating to the inductive process in instruction is recommended.

Educational Values of Biology

Study of biology is rich in educational values. Reference to the comparative evaluations in Chapter II recalls the opinion stated there that no other study is richer in its possible contributions to the equipment of the youth for successful living. It is necessary as a preparation for the study of agriculture, general and specialized. Scientific agriculture became possible only with the development of biological science in its functional aspects. Nor can the teaching of agriculture as a scientific procedure be effectively accomplished without a sure basis in sound biological training. And this is particularly true of the specialized branches of agricultural science, among others horticulture, animal husbandry, forestry, breeding, seeding, improvement of stocks, animal and plant hygiene.

Biology is the prerequisite for medicine. Modern medicine dates from the time when biology became well-established as to its essential principles, and is wholly unintelligible without instruction in the mother science. Back of the new surgery and science of medicine is the work of Darwin, Huxley, Koch, Pasteur, and their associates and successors. So completely has medicine become grounded in biology that it is no longer possible to follow the instructions of the family physician intelligently without a knowledge of biological fact unknown two generations ago.

Psychology and its cognate subjects, likewise, are grounded in general biology, and the great victories

of modern science, sanitary engineering and public hygiene, also owe their existence to the facts and principles marshalled for use by the explorers of the organic world. Without going into detail, it is evident that the student here comes into possession of the key which unlocks to him the meaning of the great advances of later civilization, a knowledge without which he will remain in outer darkness as to the important things of our day and the next.

The practical value of biology—There are also immediate practical contributions of biology to the work of the gardener, housekeeper, orchardist, farmer and stock-raiser. The knowledge of the conditions of plant growth, of seeding, fertilization, plant foods, light and moisture conditions, is of direct value to the gardener and florist. Knowledge of the life history of weeds and grasses, which compete with garden plants for soil, moisture and light; of the animal pests, which feed upon growing plants, is of immediate value. The orchardist finds equal profit in the same information, particularly in the life history of the parasite with which he must contend for his crops, and in the principles of grafting, pruning, budding, and cross-fertilization. To the housekeeper the lessons from botany and zoölogy are no less useful. The life-history of insect and rodent pests of the house and methods of exterminating them; the identity, life-history and methods of dealing with the many forms of bacterial life, both friendly and hostile, with which the housewife must concern herself; the biological aspects of preserving and preparing foods and of cleaning; there is in these applications, which the in-

telligent woman will make without further technical training, a vast deal of information of immense value. Much of the foregoing knowledge is also of immediate use to the farmer and stock-raiser. The ecological aspects of plant study offer direct and extensive application to the planning and cultivation of crops. The principles of nutrition and heredity are working rules of the stockman. These few illustrations will serve to show the great practical value of biology to all kinds of people and all kinds of activities. Certainly no more useful subject is offered in the high school. It is worth while to call attention in passing to the importance of emphasizing the practical applications of the knowledge acquired in biological study, for the reason that many teachers miserably fail at this point. Such emphasis will make the subject of unfailing interest to the student, and greatly enrich the educational service of the school. Teachers are being urged to relate all instruction more closely to the life of the learner, both his life as a youth and the life which awaits him as an adult. Biology, next to English possibly, offers the best conditions for doing this. To fail to do this would be inexcusable.

Biology teaches the laws of health—The opportunity for teaching the laws of health by way of application of the facts of biology has been discussed in the preceding paragraphs. How this may be done will be apparent to the teacher at once, and it is sufficient to urge the importance of this opportunity. The duty of conserving health is paramount to all other functions of the school, and it is a grievous betrayal of respon-

sibility to overlook any means of creating a sane public intelligence with regard to the laws of proper living. The responsibility of the biology teacher in this connection is very great, greater seemingly than that of any other teacher in the high school.

Biology teaches the fundamental principles of ethics—Among the "instrumental" values of biology must be considered also the opportunity to impress upon the pupils the fundamental principles of ethics. This may be accomplished in two ways; through developing inspiration for lofty living, and by direct applications of biological fact to clearing up certain delicate problems of morality. The teacher has the opportunity in an unusual degree to glorify life, to create zest for a thoroughly adjusted and biologically successful life. A wonderful impetus is thus given for clean living. Life may be made a thing so wonderful that it becomes sacred, and its imperfections a source of keen pain. Through an intimate acquaintance with nature the way leads straight up to nature's God. The youth attuned to the beauty of the world about him, to its wonders, and to its spiritual content, is lifted to a level above the ugliness of dissipation and sin. The love of life is incompatible with immoral living. The principle involved is that youth is lifted to a level of living above the base and ugly by his appreciation of the glory of life developed, or which may be developed, through an intimate knowledge of its varied forms acquired as individual problems are worked out. The naturalist catches the spirit of the world of beauty and wonder into which he has been adopted.

The second contribution to the ethical development

of the student in the study of biology relates especially to the matters of sex and dissipation. It is generally agreed that the essential facts of human sex life may be presented incidentally in connection with the study of reproduction of plants and the lower animals with such clearness as to protect the pupil from the criminal misinformation with which the quack assails him, and with such dignity as to rob the whole subject of ugliness and prurient curiosity. The Hebrew prophets understood in their day what modern life is reinforcing, that the stability of an individual or a nation in every respect, ethically, physically, industrially, socially, depends upon chastity; and that chastity depends not upon the innocence of ignorance, but the wholesome-mindedness of a proper and dignified understanding of the relation of sex to life in the large. The youth who is led to see sex processes as cooperative with the Creator in the perpetuation of life comes to think of them in a larger way and on a higher level, which powerfully reinforces his ideals and his will. Once he comes to see his sex functions in this higher and more significant light, he finds himself in possession of a self-mastery which is not so easily secured by mere self-abnegation. The second principle which may be given a definite ethical application is the almost universally prevailing freedom of nature from dissipation. The creatures of wood and field do not assault their physical machinery with unreasonable demands of all kinds. They avoid poisonous foods and drinks, they do not give themselves up to excesses of passion and appetite, they do not educate tastes for harmful foods and beverages, they do not waste them-

selves in the pursuit of wealth, power, prestige or pleasure. Birds and beasts were the first temperance society. They were the first association to promote sane living. The teacher of biology has at hand a wealth of data for sending home the great lesson of conservation of physical energy. It may be argued with good reason that the teacher of this subject may accomplish more than any other teacher in the school or college in laying a proper foundation for a vital morality.

The cultural values of biology—The cultural values of biology are almost as rich as those outlined in the preceding paragraphs. The emotional experiences which accompany the unfolding drama before the youthful explorer are among the most definite and abiding experiences of student life. It is debatable whether literature, even, is so rich in the sentiments stimulated day after day. First among these to be noted are the intellectual delights which are aroused as the intricacy, delicacy of adjustment, and the unexpectedness of form, structure and function are revealed. The ever new marvels of adjustment, and the increasing inexplicableness are calculated to stimulate increasing interest and to give keener and keener delights. Much has already been said of the refinement of thought and feeling wrought in the pupil under the spell of the natural world. It is a fact of common knowledge that the naturalist is a poet. His life in a world of beauty inspires him with flights of poetic thought. In his effort to give proper expression to his insights and emotions he falls into symbolism and rhythm. The beauty of forest and field awakens the

artist within the man. The liberalizing value of biology also must be rated high. The study of life relations and the myriad folk of nature lifts the individual out of his narrower circle of thought and feeling and makes him a citizen of the world of living things. The fund of knowledge acquired affords a self-mastery, a mastery of environment and an intellectual independence which increases individuality, while at the same time raising the student above petty considerations and interests. The broadening influence of a study which makes the pupil akin to the whole world and opens up to him the deepest problems of reality must be very great indeed. Biology is highly reconstructive in the sense that it offsets the effect of classical and physical studies. It may also, of course, bring about a reorganization of concepts of life and life relations formed in the nursery and from early teaching. The reconstructive tendency of biological study in the life of the individual may be estimated from the changes which it has brought about in philosophical and religious thinking during the last half century. Biology now dominates the thought of the world.

It is obvious that the instrumental and cultural values outlined thus far, particularly the cultural values, are conditioned by the method of teaching in vogue. If the subject is presented in the spirit of the foregoing discussion and with the object of accomplishing the results potential in the subject, the values given above will be largely, if not fully, realized. But if the subject is treated merely as a matter of learning a text or following out the directions of a

laboratory manual, failing to see the beauty and wonder of the wild life and the larger aspects, biology may be as barren of results as memorizing dates in history or logarithmic tables in mathematics. The "disciplinary values" likewise depend upon the method of instruction. If the method is organized to secure certain disciplines as well as to awaken an abiding interest and acquire a fund of information, the educational worth of the study will be greatly enhanced. Just as we found with reference to the subject matter involved that no other study can properly be substituted for biology, so we will find that no other subject contains the elements of specific training which are involved in biological studies. The essential nature of the training afforded in biology furnishes a second conclusive reason for including this subject in the high school curriculum. There are four of these disciplines. The first is the habituation of the pupil in scientific observation and simple induction. The importance of this training is revealed when we reflect that this is the species of thinking which constitutes the larger part of the systematic thought-life of the adult. The second variety of training, which is secured almost exclusively in the systematic phases of botany and zoölogy, is in exact classification. To think is to classify. Judgment is classification. The art of classification which the pupil may develop in botany and zoölogy has large potential value in training him to be a thinker. The third discipline peculiar to biology is the use of the type-concept in thinking. In the exact sciences we employ the truly universal concept. The law of fall-

ing bodies applies equally to all cases. The value of "Pi" is everywhere and under all conditions the same, but the general concepts of biology do not have this universality, this invariableness. No two wild-rose plants will attain the same height, have exactly the same leaf-form and structure, the same color of petals. Variability from the normal is to be expected. The nearest approach which a biological statement can make is to say that the rose will be found "generally," or "more frequently," to grow in such and such a place, between such and such heights, and to exhibit such and such other characteristics to approximately the same degree. The "central tendency," or "most frequently occurring" is taken as the type or norm in thinking of the class, and as representative of the class. This variety of concept is characteristic of all subjects dealing with living things, and facility in its use is of utmost value. Again, no other study can be accepted as a substitute for biology in this species of discipline. The fourth discipline is the habituation of the pupil in the use of the concept of functional relations. This is a type of idea which the student has not experienced in the other sciences as definitely as he must in biology. More and more he becomes accustomed to thinking of the creature as a something which behaves in such and such ways. Study of the creature resolves itself chiefly into a study of its modes of behavior. This habit of thinking in terms of behavior equips the pupil for many of the demands which he must experience in adult life. It would be out of place in this

chapter to dwell upon the significance of the four types of discipline which biology, properly taught, will contribute to the education of youth, and which no other subject will provide, at least in a manner so rich and definite. Suffice it to urge upon the teacher the duty of utilizing this very great opportunity of giving his pupils a training in methods of thinking which will be of inestimable worth to them throughout all life.

To summarize this discussion, we have endeavored to call attention, very briefly, to the following educational values latent in the subject of biology as a school subject, and realizable under proper methods of teaching:

I. Instrumental.
   1. Preparatory to the science of agriculture, general and specialized.
      Preparatory to the science of medicine.
      Preparatory to psychology and cognate subjects.
      Preparatory to science of sanitation and public and private hygiene.
   2. Of immediate applicability by the gardener, farmer, stockman, orchardist, housekeeper, etc.
   3. Offers opportunity for laying the best foundation for ethics.
   4. Promotes public intelligence with reference to laws of health.

II. Cultural.
   1. Awakens the keenest intellectual delights,

stimulates a deep emotional experience, reveals a world of entrancing beauty, arouses animating interests.

2. Has high liberalizing value, giving the pupil the larger viewpoint for his thinking, making him a citizen of the world of living things, and giving a fund of information and insights which greatly free him from the prevailing limitations of life.
3. Biology is highly reconstructive in the mental and spiritual life of the pupil, offsetting the peculiar effects of classical and physical studies, and giving him the higher and larger viewpoint in which he himself occupies a less prominent place.

III. Disciplinary.

1. Habituating the pupil to scientific observation, to careful induction, to classification, to the use of the type-concept in thinking, and to the concept of functional relations.

Teaching Objectives

In discussing the teaching objectives in high school biology we need but to restate the values outlined in the preceding section as aims of teaching. First, what knowledge should the pupil be expected to acquire? As a basis for other knowledge he must form an acquaintance with types of animals and plants. Some orders of life comprise a small enough number of individuals that the pupil may reasonably be expected to know the characteristics, so as to identify

any creature belonging thereto at once as to species and so forth. In the larger orders this requirement is obviously too difficult, and here the pupil should become so familiar with family characteristics that he can at once associate any specimen with the family to which it belongs, and be able by means of keys to complete the identification in detail. If type-concepts are really mastered, the task of classification of individual cases is not only facilitated but made less mechanical. Identity is the first relation of the individual to be learned, and no pains should be spared to make the pupil skilful in the process of identification. Learning the type-concepts, more than mere practice in identification, will give this skill. In addition to this knowledge, the pupil should have an intimate acquaintance with the fauna and flora of his own vicinity.

The second variety of knowledge to be acquired is animal and plant ecology, the modes and conditions of behavior. The food supply of animals, how procured, its seasonal variation, the creature's adjustment to extremes of temperature, of water supply; its methods of protection from enemies; the foods which plants require, how they are procured, how taken into the plant body, how digested, how assimilated; such topics should receive very careful consideration. Special attention should be given to the processes involved in nutrition, growth, reproduction, and the generation of new species and varieties.

A third line of knowledge comprises the phenomena of interdependence of plants among themselves, and of plants and animals. Fourth, much should be made of the economic uses of the various animals and plants

studied. This is a phase of the subject which appeals strongly to students, especially to the boys, and will insure the practical values discussed above. Man's clothing and shelter are for the most part procured from the animal and plant world. Full and reliable information with reference to the sources of these utilities certainly is desirable. The last knowledge objective is the æsthetic relations of the plants and animals studied. This phase of study has already been sufficiently emphasized in the preceding sections.

The second teaching objective is the stimulation of the emotional experience to which frequent reference has already been made; the feeling of wonder elicited by perception of the curious and often marvelous provisions of nature for the maintenance of life; the sense of the bigness, complexity, and close organization of the world; the sense of the joy in the world of wild things; the feeling of the presence of God in the world, caring for His creatures. The enthusiasm of discovery and exploration is, in itself, a most wholesome experience, making not only for the growth of personality but also correcting to considerable extent the deadening influence of school routine.

The third objective is the development of facility in accurate observation of individual cases, in abstraction, comparison, and in generalization from individual cases, in the classification of data, and the formation of type and functional concepts. The nature and value of these skill-objectives have already been discussed.

Teaching Objectives in Biology

I. Knowledge objectives.
   1. Knowledge of animal and plant types, with mastery of accepted classification, and an intimate knowledge of local fauna and flora.
   2. Knowledge of plant and animal ecology.
   3. Of interdependence of plants and animals.
   4. Of biological processes.
   5. Of economic uses.
   6. Knowledge of æsthetic relations conceived by man.

II. Emotional experiences: wonder, enthusiasm, interest, feeling of the spiritual aspects of nature.

III. Discipline: facility in accurate observation, in the processes of scientific induction, in classification, and in forming type and functional concepts.

The Course of Study

The content and sequence of the high school course in biology are so completely conditioned by local factors that to undertake to present a type course of study is not advisable. Bearing in mind the function of the high school to supplement the elementary school, it is obvious that the allotment of time in the former to any study, and particularly to a study like biology which should be extended over a long term of

years, will depend considerably on the scope and quality of instruction in the earlier grades. Likewise, in determining the division of time between biology and other subjects, such as history and English in the high school, we must be governed largely by the extent and content of training in those subjects in the elementary grades. In view of these considerations, it is impossible to be specific with regard to the amount of time and scope of work which should be required in high school biology.

There would seem to be no need of argument in defence of the proposition that every high school pupil should have a minimum of a half year of physiology, hygiene and sanitation. It were better, and the practical values justify it, to have a full year for the course. There will be a difference of opinion, supported by facts, as to the school year in which such course should be given. In view of its utility and also of the large loss of attendance in the earlier years of the high school, there is good reason for making it a first-year (9th-year) subject. On the other hand, its logical relations to other biological studies and to physics, chemistry and civics, are such that the course will be more easily presented, and richer in meaning for the pupil, if given in the fourth or senior year, and certainly not earlier than the third year. Again, the local administration will have to be governed largely by the status of the pupils as they reach the high school, and the success of the school in holding its pupils. The assumption will probably not be questioned that the more specialized branches of biology, as histology, embryology, anatomy, and the

specialized branches of botany and zoölogy, are properly college studies and have no place in the high school, regardless of the time available.

This narrows our consideration to three studies, in addition to the course in physiology, hygiene and sanitation—botany, zoölogy and general biology. Properly, a year of work is the minimum acceptable for a high school science. Less than this time-unit does not give a sufficient working period to carry through lines of development, or to permit that maturing of insight which is after all the essential factor in the learning process. Only the most serious exigency should be regarded as a sufficient reason for reducing the minimum below the full school year. On the whole, it seems to be better to devote an entire school year to either botany or zoölogy, ignoring the other, than to divide the time between them. It is wholly inadvisable to undertake a course in general biology in less than a full school year. There has been a disposition in some quarters to substitute general biology for botany and zoölogy. There may be local conditions which favor this arrangement, but, on the whole, the writers prefer to devote the time of the high school pupil to the latter subjects, leaving the course in general biology to the college, rather than the obverse sequence. It seems to them vitally important that the pupil get acquainted with the creatures as such, and, if there is not sufficient time available to cover the whole field in an approved manner, to supplement these "survey" studies by developing incidentally the major biological principles in the manner suggested in the first half of the chapter.

Methods

In general, the method of teaching biology in the school or college is the same as the method of biological research. It is the method of exploration, discovery and experiment. The psychological process, as set forth in the first part of the chapter, is the process of simple induction supplemented by experiment. The discussion of this process throughout the chapter and in Chapter III would seem to be adequate both for clearness and emphasis.

It is in order to remind the teacher that biology is essentially a *field study*. The textbook should serve rather as a manual for systematizing observation and experiment. Strictly speaking, the laboratory method as such should not be employed in the high school in connection with this study. In the college the biological laboratory has its place, and the laboratory method furnishes the proper procedure. In the high school the laboratory may be entirely disposed of without serious loss. Certainly microscopic studies, except to demonstrate the structure of tissues, or to exhibit now and then a minute type of life, should not be given the place of things more important for high school pupils. These observations are meant to imply, also, that the equipment of the high school biological laboratory should be very simple indeed. One or two compound microscopes, a few dissecting pans, a half-dozen sets of dissecting instruments, a large number of moderate-priced magnifying lenses, and collecting-nets and cans, should constitute the

major equipment. An aquarium and some cages for insects and others for small animals should be included. One or two good cameras, a dark-room, and a half-dozen field glasses should take the place of the microscopes which this plan would omit.

The investment of energy and funds in a highly-equipped biological laboratory is more profitably devoted to building up a department library. Equally with history and English, the department of biology needs a large and well-chosen reference library. This library should contain, in addition to works recognized as authoritative in the several fields of biology, a vast deal of material of a popular but trustworthy character which will serve to supplement the observation of the pupils, convey additional information, suggest new lines of investigation, arouse fresh enthusiasm, and reveal insights which ordinarily would not occur to the average youth. Representative of this class of material are the writings of John Burroughs, the popular articles of David Starr Jordan and Theodore Roosevelt, Roosevelt's "Wild Animals I have Known," and the vast collection of nature stories of high grade in the better-class magazines. There should be included an extensive collection of pictures, prints and photographs, which may be collected through the National Geographic Magazine, Underwood and Underwood, and similar agencies. The biology library also should contain the splendid series of bulletins relating to animal and plant life published by the Bureau of Agriculture at Washington, and the cognate publications of other bureaus of the Department of the Interior.

Summary

The biological sciences are essential to an understanding of the world in which we live, and to an understanding of ourselves as living in the world. They deal with a class of phenomena not presented in any other study, and involve methods and limitations of thought not met with by the student in any other subject. The curriculum which omitted biology would be grievously imperfect and inadequate.

The study of biology properly begins in the field, rather than in the laboratory, with observation of plants and animals in their natural habitat rather than with the microscope.

Plants and animals, also, must be studied in their relationships, not merely as individuals. Emphasis should be placed on how the creature lives.

Biological study requires time; in fact, that the young naturalist shall extend his field work over several years and through all seasons of the year. Brief courses in physics and chemistry may accomplish worth-while results; not so in biology.

The instructor must bear in mind that the validity of induction depends upon accuracy of observation, an art not easily acquired. It requires long and sedulous training to make the normal youth see and tell "the truth, the whole truth, and nothing but the truth."

The pupil must be trained also to avoid hasty inference.

Biological science involves two types of investiga-

tion, the one relating to the identity and kinship of individuals, and the other to the anatomical, morphological and ecological relations. Logically, the so-called "systematic studies" precede the "functional studies." Both should be included in the course of study.

References

Bailey, Liberty H. "The Nature-Study Idea," The Macmillan Co., New York.

Cobb, Cora S. "God's Wonder World," American Unitarian Association, Boston.

Downing, Elliot R. "Field and Laboratory Guide in Biological Nature-Study," University of Chicago Press.

Eikenberry, William L. "Problems in Botany," Ginn & Co., Boston.

Ganong, William F. "The Teaching Botanist," The Macmillan Co., New York.

Gruenberg, Benjamin C. "Manual of Suggestions for Teachers," Ginn & Co., Boston.

Hamilton, David W. "Nature-Study Lessons," Renout Publishing Co., Montreal.

Hodge, Clifton F., and Dawson, Jean. "Civic Biology," Ginn & Co., Boston.

Hunter, George W. "New Essentials of Biology Presented in Problems," American Book Co., New York.

Lloyd and Bigelow. "The Teaching of Botany in the Secondary Schools," Longmans, Green & Co., New York.

"Reorganization of Sciences in the Elementary Schools," U. S. Bureau of Education Bulletin.

Trafton, Gilbert H. "Biology of Home and Community," The Macmillan Co., New York.

VanBuskirk, Edgar F. "Place of Sex Education in Biology and General Sciences," 1919, U. S. Public Health Service, Washington.

Woodhull, John F. "Teaching of Science," The Macmillan Co., New York.

CHAPTER XVI

PHYSICAL GEOGRAPHY

Physical Geography is the representative in the high school of the group of studies known in our classification as the "earth sciences." It is not so much a science as it is a combination of the elementary facts and principles of a number of sciences. Strangely enough, while it is impossible to fix the lines of demarcation of this subject, it is by convention the best defined as to subject matter of the science studies of the high school course.

Physical Geography, or Physiography, as it is sometimes styled, comprises four general divisions. The first is concerned with the astronomical facts and relations involved in the place of the earth in the solar system, and serves the double purpose of giving the student a proper point of view for the other topics in the course, and also of forming an introduction to the science of astronomy. The second division treats of the facts and processes which are at work in the shaping of the earth's crust and its atmospheric envelope. The third division is historical and descriptive, presenting a view of the physiographic features of the earth's surface resulting from the operation of the forces described in the second division. The fourth division deals with the distribution of plant, animal and human life as determined

by the forces and features portrayed in the second and third divisions.

Educational Values

The educational values of physical geography depend upon the character of the instruction. The subject may be presented in such manner as to give it very great value, or it may be presented in such mechanical and nonvital fashion as to yield to the pupil no perceptible increase of knowledge, personality or discipline. It is rich in possibilities in the hands of a teacher who combines large scholarship in the other sciences and especially in geology, and who has had also proper scientific training. It has large possible values as an introduction to the sciences of astronomy and geology, and should be taught with the object of giving pupils enough insight into the scope and nature of these two fields to awaken the desire for more knowledge. Those phases of the subject which portray the processes involved in soil-formation, erosion, inland water supply and weather phenomena, lead directly into the science of agriculture.

Physical geography may prepare the student for more intelligent work in economic geography. The admirable little book by Semple, "American History and its Geographic conditions," and its companion volume, show that it is indispensable as a preparation for the study of history both industrial and political. It has been said that nations, like armies, "travel on their bellies." In the last analysis, food, clothing, fuel and building materials are determined as to loca-

tion and availability by physiographic agencies. Two factors combine to produce the stream of human history, the personal and the physiographic, the personality of the human stock and the physiographic forces, with which or against which man contends. It is evident from this fact that the student who would understand human history, economic, political, and social movements, must study them in the light of the factors and conditions presented in the physical geography of the region involved. Obviously, the botanical and zoölogical history of any region also is conditioned in like manner. This means that the course in physical geography, even as it may be taught in the high school, may have very great value as a preparation for subsequent and more advanced study of natural sciences and of history and the social sciences.

The practical availability of the subject is obvious. The farmer profits directly from his knowledge of soil formation, irrigation, drainage, water supply and weather phenomena. The last variety of information is of general utility. To the statesman, who must be able to predict the spread of population and the rate and direction of economic development, and to the industrial promoter, the practical utility is far greater.

The cultural values are not so obvious. This subject, like all others, offers the opportunity to awaken zeal for scholarship, and with the increase of knowledge and understanding here presented, as of other varieties of knowledge, there comes growth of personal force and self-mastery. The study of the phe-

nomena of water and volcanic action may open to the student a view of wonderful proportions, stimulating his emotions to poetic heights. Properly taught, physical geography should give a very definite emotional experience.

The variety of discipline which the pupil receives in this study depends altogether upon the methods of instruction employed. There are at least three disciplines possible: the acquisition of the "survey" method of investigation, facility in the use of the type-concept in thinking, and practice in deductive reasoning in the application of geographical principles in working out the problems presented in new situations.

Résumé of Educational Values

I. Instrumental.
   1. Introductory to astronomy, geology and agriculture.
   2. Preparatory to economic geography, to industrial and political history, to the social sciences, and to botanical and zoölogical history.
   3. Wholesome emotional experiences aroused of practical value to the farmer, to the general public, and to the political and industrial leaders of a country.

II. Cultural.
   1. Scholarly interests and enthusiasms cultivated.
   2. Growth of personality stimulated.

3. Wholesome emotional experiences aroused by vision of the tremendous energy at work in the "forces of nature."

III. Disciplinary.
   1. Training in the "survey method" of investigation.
   2. Training in the use of the type-concept in thinking.
   3. Training in deductive reasoning.

Teaching Objectives

Restating the educational values potential in the subject of physical geography as aims of teaching, we have the following objectives set out for our accomplishments:

1. Knowledge objectives.
   1. Concepts of the physiographic forces and the processes which they cause, together with the laws of their operation.
   2. A general knowledge of the results of these processes throughout the world; of the physiographic features of the United States in some detail; of the physiographic features of the pupil's own region in full detail.
   3. A knowledge of the facts of the distribution of plant and animal life, together with the laws governing such distribution, and with an introduction to historical geology.

4. An introduction to the geographic influences in human life, with an insight into the operation of the same in determining the distribution of population, location of political groups, boundary lines of states, economic development, racial progress, etc.

2. Feeling objectives.
    1. Enthusiasm for understanding of the ultimate foundations of human life.
    2. An active interest in astronomy and geology, leading to the desire for mastery of these subjects.
    3. A sense of the mighty forces silently working to model the form and configuration of the earth, and of the enormous energy employed by nature.
3. Skill objectives.
    1. In the use of the survey method.
    2. In the making and interpretation of the several kinds of maps.
    3. In the measurement of weather data, and the prediction of weather conditions.
    4. In deductive thinking as employed in working out geographical problems.

The ground-work of physical geography—It is evident that the ground-work of physical geography consists in the acquisition of clearly-defined and adequate concepts of what have been called the "geographic elements," that is, of the forces of air, water, heat and light, which working together on the materials

of the earth's crust, have made it as the pupil finds it. These forces operate in well-defined ways known as geographic processes, which are governed by certain laws and principles. A knowledge of these facts enables the pupil to think out for himself the problems which are constantly presented to his attention, and to discover the interpretation of the facts of his environment. A knowledge of such facts as water and wind action, climatic processes, the phenomena of the earth's cooling, is alphabetic in geographical thinking. Such concepts are fundamental. They become the tools of investigation and of interpretation of geographic features. Clearly they should be thoroughly mastered.

Following the acquisition of this body of "working concepts" are the study of the existing topographic, climatic, and other physical features of the earth, and the study of the distribution of plant and animal life resulting from or conditioned by these physical features. It is sufficient if the pupil comes to an understanding of these facts only in general, for the world as a whole, but in getting this general view of the earth, it is materially helpful to organize the information by regions. The geographic features of the United States, as one of these regions, and of Canada as another region, or as part of the United States region, should be learned in considerably greater detail. The state or section of the United States in which the pupil lives should be mastered in full detail and as concretely as possible. If the pupil is to be helped to a full and adequate knowledge of his own section of country, he must procure much of the pre-

ceding knowledge in general, and will acquire the apperceptive material which enables him to understand the rest of the world far more clearly. Great emphasis should be placed upon these local studies. The instruction in this division of the subject should be given with the greatest care, for the reason that the subsequent study of economic, commercial, political and social geography must depend wholly upon the adequacy and vividness of the concepts which the pupil acquires in the first and second lines of work.

In view of the nature of its content and the illumination of human history which it affords, the fourth knowledge objective should appeal most strongly to teacher and pupil. Strangely enough it is the phase of the subject most commonly omitted. Physical geography comes to its fruitage in the light it throws on the facts of industrial and political history, in fact all history. Professor Dryer recommends, in view of the importance of this division of the subject, that it receive one-half of the time allotted to the course.

Physical geography serves as an introduction to other sciences—Of the feeling objectives indicated, the second and third are of special importance. Physical geography is not so much a science as an introduction to several sciences, the most conspicuous of which are astronomy and geology. The former is of such great cultural value, and the latter of so much practical utility, that all students should, if at all possible, be induced to take courses in both sciences of sufficient extent to insure real scholarship in both. Developing an enthusiastic appreciation of the wonders of the Heavens, "the handiwork" of the Almighty, and the

tremendous geological forces at work, together with the more prominent facts of historical geology, will create a lively interest which will carry the student on to more advanced studies. Possibly the teacher does the pupil no greater service than in thus planting and cultivating interests which become the dynamic of his later years. The subject also offers a splendid opportunity for stimulating the feeling of wonder, a sense of bigness of the world, and the spirit of humility, through opening up to the pupil a view of the enormous forces at work carving out hills and valleys, rounding off the mountains, building plains, giving the home of man both beauty and availability of resource; or for giving a conception of the great periods of time employed; and together with these, the modest silence of these gigantic forces—through thus introducing the pupil to God at work creating the world we live in.

The survey method—Much has already been said in the foregoing paragraphs with reference to the use of the "survey method." The method is not at all new, but has been given new significance in recent years by its employment in new fields of inquiry. As a mode of investigation it possesses certain advantages which insure its permanence. It will, therefore, be of real service to the pupil, whether he ends his education with graduation from the high school or goes on to higher schools, to give him such skill in this method of work as will enable him to interpret properly the findings of surveys, and to engage efficiently in such investigations himself. If this subject is taught, as is urged by such authorities as Professor

Salisbury and Professor Dryer, affording the student practice in exhaustive surveys in designated fields, it will be the means of giving considerable skill of this variety. The method of attack thus developed may prove, as a by-product, to be one of the prominent values derived from the study.

The use of maps—The best teachers of physical geography place great stress on training the student in the making and use of maps, and rightly so. There are two reasons for this. First, the map is the language of record in geography, and obviously must be mastered in order to make the rich content of map-material available to the student. Second, the pupil will be expected to record his surveys in the form of maps and charts, and for this additional reason must acquire facility in the use of map-language.

Lastly, a word should be said, by way of emphasis, of the value of training pupils to determine and record data from which the weather may be predicted, and to make weather forecasts. No one thing is of more concern to more people than the weather, and no ability is of more practical worth and satisfaction than the ability to interpret weather records and facts in relation to local conditions and interests. This variety of training also has considerable value in developing the scientific attitude of mind.

The Course of Study

The minimum time allotment to physical geography which will permit a reasonable survey of the whole subject is one year. It is not possible to cover the

whole field in less time. To undertake to do so will require the sacrifice of the quality of instruction or the omission of parts of the subject. Two years may very well be given to the study as presented in the better textbooks. The relations of the subject to other sciences, and the general character of its content, make it possible if not advisable to place the course in the earlier years of the high school. "Physical geography is classed as a fundamental or basal science. It may be taught either in the early years of the high school or in the later years. From the nature of the first statement it can readily be inferred that a position in the freshman or sophomore years of work is vastly preferable. It furnishes a study of the physical environment of plants and animals and contains so few principles of chemistry and physics that can not be taught in the freshman year that both groups of science argue for the early position in the course." [1]

The sequence of topics should be substantially that indicated in the first section of this chapter. The sequence of treatment exhibited in Dryer's "High School Geography, Complete," a quite popular textbook, is recommended as satisfactory, theoretically and in practice.

Equipment

Physical geography, properly, is a field study. There is a certain amount of experimental work in connection with weather phenomena, but this may as

[1] Indiana Department of Public Instruction, Bulletin 35.

well be done in the physics laboratory and save duplication of apparatus. The department of geography should have a laboratory outfitted with the necessary globes, facilities for sand and clay modeling, and a complete equipment of relief-maps, wall-maps, and sheets. It is also essential that the classes have access to a well-stocked reference library. Lists of maps and reference-material are suggested at the end of the chapter.

Methods of Teaching

Let us quote again from Bulletin 35 of the Indiana Department of Public Instruction: "Whether physical geography is a science or not is a point which has been much debated. It is also a point which is scarcely worth debating. The essential fact with reference to it is as to whether it is taught scientifically or not. The nature of every science demands that it be taught from the laboratory standpoint. Likewise, the nature of every subject demands a scientific treatment. So in the following outline it will be continually urged that the work be taught from the laboratory and field standpoint. If it cannot be so taught, it is decidedly questionable as to whether it is worth while to teach it at all." "Of all subjects that may be treated from the standpoint of field and observation work, none lends itself more readily to such treatment throughout the school year than does physical geography." These quotations state very clearly the point of view to be taken by the teacher. He is to employ a combination of the laboratory and

the field methods of teaching. Above all, he is not to treat the subject as a "text-book study" to be crammed at so many pages a day.

In order that the lesson shall work toward the objectives stated above, the following procedure is suggested for the class exercise:

1. Survey a given territory, fact or group of facts, selected as a type involving the general fact or principle, the concept of which is to be developed, and ascertain all of the facts, features and conditions observable.

2. Formulate the problem or problems which the existence of the situation raises.

3. Find the solution of this problem or the problems by further exploration, appropriate experimentation, and reference reading, developing therefrom the concept of the principle to be learned.

4. Apply this principle of general truth in further surveys, reports and class discussions.

To illustrate, suppose the aim of the lesson is to present the fact of glacial action in a class in one of the North Central states. We will also suppose that near the school is a field well covered with boulders, relics of glacial drift. The class will be expected to inspect this field, noting the character of the stones, their composition, their structure, shape, color, surface and any other characteristics, and will be led to develop the following questions, or questions similar to them:

Are these stones native to the locality, or foreign?
How do you explain their shape?
What kind of rock are they?

Where may the same sort of stone be found in masses which seem not to have been disturbed?

How did these stones get here?

To answer these questions, the pupils have recourse to their textbook, their reference books, the personal experiences of the members of the class, and the suggestions of teacher and friends. In class discussion these questions will be raised and answered. Additional information with reference to the topic will be introduced. All ideas submitted will be checked up and organized into a working concept of glacial action. This concept will now be employed in further study of glacial history and of glacial action now in operation in different parts of the earth. The mental process involved in this method of class-exercise comprises:

1. The study of a particular situation involving the fact or principle to be taught.

2. Development, out of the facts involved in this particular situation, of a problem in the solution or explanation of which the concept to be taught is evolved.

3. This concept will have a concreteness for the mind of the pupil which makes it a part of his personal experience, and thus provides the "working concept" or necessary apperceptive basis for further study of the group of facts or principles under consideration.

Summary

Physical geography is general "earth science," comprising elements of astronomy, geographic evolution, physiography and geographic biology.

The educational values of the subject depend quite largely upon the method of teaching employed. The survey method is advised as giving better understanding of subject matter and valuable scientific training.

The teaching objectives should include, in addition to the knowledge to be acquired, an interest in the specialized sciences for which physical geography is preparatory and a sense of the mighty forces at work in the universe of which the pupil is a part. Particular skills to be developed include the survey method, the making and interpretation of maps, weather-forecasting, and deductive thinking as employed in the solution of geographical problems.

The minimum time allotment for effective work is one year. The major portion of the time should be given to field work.

References

BRIGHAM, ALBERT P. "Geographic Influences in American History," Ginn & Co., Boston.

DARLING, FRANK W. "Laboratory Manual in Physical Geography," Atkinson, Mentzer, & Grover, Chicago.

DRYER, CHARLES R. W. "Teacher's Manual to Accompany High School Geography," American Book Co., New York.

EVERLY, LU L., BLOUNT, RALPH E., and WALTON, CALVIN L. "Laboratory Lessons in Physical Geography," American Book Co., New York.

REDWAY, JACQUES W. "The New Basis of Geography," The Macmillan Co., New York.

SALISBURY, ROLLIN D., BARROWS, HARLAN H., and TOWER,

WALTER S. "Elements of Geography," Henry Holt & Co., New York.

SALISBURY, ROLLIN D., BARROWS, HARLAN H., and TOWER, WALTER S. "Modern Geography for High Schools," Henry Holt & Co., New York.

SANFORD, GEORGE W. "Outlines, Suggestions, and References in Commercial Geography," Powers & Lyons, Chicago.

SEMPLE, ELLEN C. "American History and its Geographic Conditions," Houghton Mifflin Co., Boston.

SUTHERLAND, WILLIAM J. "The Teaching of Geography," Scott, Foresman & Co., Chicago.

VANHISE, CHARLES R. "Conservation of Natural Resources in the United States," The Macmillan Co., New York.

CHAPTER XVII

VOCATIONAL EDUCATION

Vocational training is limited in the high school at present to the commercial arts, the industrial arts, agriculture and home economics. The commercial arts include: Commercial Arithmetic, Commercial Geography, Bookkeeping, Shorthand, Stenotypy, Typewriting, Office Training, Commercial Law.

The industrial arts include: Carpentry, Cabinet-Making, Sheet-Metal Work, Forging, Electrical Construction, Auto-Mechanics, Pattern-Making, Foundry, Machine-Shop Work, Printing.

The work in agriculture is confined to the general elementary aspects of the vocation, including especially soils and crops, animal husbandry, dairying, poultry and fruit-growing. The course in home economics is directed to the end of making efficient and thrifty housekeepers. A fifth line of vocational training is developed in the department of art in some schools, and includes a variety of applications of art: Printing Designs, Illustration, Advertising Art, Cartooning, Landscape Gardening, Window Trimming, House Decoration, Metal Work, Textile Design, etc. The last-named will be omitted from this discussion because of doubt as to efficient handling in the ordinary high school. These subjects occupy middle ground between the vocations of admitted secondary

grade and the professions, business and engineering which require more maturity of mind and a larger educational foundation, and for this reason are assigned to schools of college and university grade.

Object of vocational education, need of caution—The object of vocational training, primarily, is to fit the individual for remunerative employment. This is wholly worthy on the part of both pupil and the school. A healthy society is grounded in the ability of each adult member to pull at least his own load. A proper education will provide for such training of the youth either in home, school, or in industry, as will fit him to make a living, and something more. The individual who has not been thus trained is socially defective. While this is true, however, and while the present-day encouragement of vocational education is entirely praiseworthy, the subject must be approached with a word of caution, and always the vocational training of the individual must be rationally articulated with the other aspects and interests or life no less vital.

Human life seven-sided—The high school must remember at all times that the pupil is a seven-sided creature, that his life is seven-fold, and that he needs definite training for each of these phases of his life. It is well to review these seven aspects of normal human life at this point in our discussion. First of all, is the biological life. Whatever else man is or may do, he has a physical life which must be successfully lived, or everything else will be shipwrecked. His physical powers are the tools with which he works at everything else. They must be in the best of con-

dition if he does good work. He must also be husband and father, and sustain himself well in these relations, or society thus far commits suicide. On this side, education means making the best and most efficient physical man of the individual, and the best husband and father. Second, the individual must secure a living, and his nature calls for the satisfaction of his instinct of ownership. He must live the economic life, and successfully, if he and his family and his country are to survive. He is so constituted that he must acquire property. Third, he must live an intellectual life in some measure. His curiosity must be satisfied in some direction, and, the more fully and definitely it leads him to seek satisfaction of the instinct for knowledge in vitally significant truth, the more abundant will be his life and that of those to whom he contributes. Practical necessity reinforces instinct in this demand for the intellectual life. Fourth, he lives the civic life on some level of social efficiency. He must in the nature of things be some kind of a citizen. He must count for some degree of social justice or injustice. Manifestly he should be trained to count for the best. Fifth, he is a social being. He has a well-pronounced instinct for fellowship. Companions of some sort he must have. The greatest punishment to which he can be subjected is solitary confinement. Robinson Crusoe found the hermit life intolerable. Man must be identified with a group in which he finds stimulation, sympathy and the enjoyment of kind. Sixth, he must have a pleasure-life in which the whole range of wants from the desire for simple sports up to hunger for

the highest things of art are clamoring for satisfaction. His soul must have sunshine. Seventh, man is a religious person. His religious nature may be intermittently active, but there is in him a more or less conscious sense of his relationship with God, and the effort to make this relationship harmonious. Man is seven-sided. He is living seven lives in one, or, he is living a seven-ply life. He is at once and all the time, a Family man, a Pleasure man, a Society man, an Economic man, a Civic man, an Educational man, and a Religious man. He may shirk any one or more of these lives, but he cannot altogether escape them, and the consequences are inevitable. He may live any one or more of them on a low level of efficiency, but it will be at the expense of himself and also of his generation. A proper education must raise him to the highest level in each of these relationships. Nor does the principle of division of labor apply here. Specialization is safe only after the individual has secured those general attainments which make him an efficient person in each of his seven relationships. Any specialization before this attainment is reached results in the production of a social defective, the burden of whom to society is likely to more than offset the value of his specialized service.

Tendency to overestimate the economic factor in life—The reason for reminding teachers of this larger function of education is the current tendency to overestimate the economic factor in life. Making a living is essential, but it is only one of seven essentials. The man himself is always more important than his job, or than what he eats and wears. The whole is

bigger than its part. Much of educational discussion to-day overlooks this exceedingly simple but vital fact. Training in a vocation is one of the co-ordinate parts of a rational education, but it is not more than this.

The pupil should not be pigeon-holed—In planning vocational courses care should be exercised that the pupil is not "pigeon-holed" in a level of employment below that of which he is capable. This warning applies particularly to commercial departments and "business schools," where thousands of really capable youths are chained to small jobs for life. It is a serious wrong to shut a boy away from larger activities for which he is by nature fitted, a wrong to the boy and to society. Society needs to have each individual at work on his highest possible level. Our country, in fact the whole world, is now suffering from a famine of workers on the upper levels. Not because there are not enough individuals with the native endowments required, but because the shortsightedness of youth, parents, and school authorities has shunted so many capable young men and women into "blind alleys." A course in commercial training may be the worst thing possible for the high school boy. It certainly is, if it means hiding him away in a small office job.

Closing the door to advancement undemocratic—This warning also attaches to certain recent legislation relating to admission to vocational schools. In some cases these regulations require that pupils and parents specifically obligate themselves that the pupil shall not pursue his education beyond the completion of the vocational course. This policy deserves the

severest condemnation, as utterly wrong in principle and in practice. It is undemocratic, and un-American. It closes the doors to possible advancement instead of opening up continuous pathways. Back of the policy is the un-American doctrine of caste education borrowed from a nation whose education, as well as whose political philosophy, has recently received the just condemnation of mankind. But it fails in practice also. It is as important vocationally for the individual to get out of the life-work for which he is not natively adapted as it is to train him in the calling he has chosen. A primary function of vocational education is to help the boy find his proper place as a worker. The business of the teacher of mechanics is first of all to discover, and help the boy to discover, whether the pupil has those native capacities which will enable him to become an efficient mechanic, and whether the school might be spoiling a much-needed and valuable worker in the higher ranks of activity by binding this youth to the machine shop. If the teacher does not perform this service, he is certain to fill up the ranks of workers with misfits, and the ultimate outcome may be worse than if the school had kept out of the field. The ministrations of the vocational school should be devoted to those individuals who by native endowment are most sure of making the best out of life for themselves, and for society in the fields of work for which the school offers training. The school should keep constantly in mind its function to sift out types of workers and to help each to get into the proper employment. Above all, there should be no closed doors in education except to the unfit.

Misconception of the economic process—A serious oversight in the current vocational program grows out of the fallacious conception that the economic problem is a matter of increased production. Particularly during the war was this idea emphasized. We observed the strange paradox of heroic effort to increase production of materials of all sorts, combined with the most abandoned orgy of spending in the history of the world. We face the curious situation of half of the world in starvation while the rest has an unparalleled surplus of all materials. America's economic problem is not so much one of increasing production as of efficient distribution and equitable exchange, together with a sane economy in the use of materials. We are lamentably weak in our system of marketing our produce, and our extravagance in the face of the want in our own land as well as abroad is a crime. Many teachers of home economics are revising their courses in order to provide for training their pupils to work over clothing, and to utilize all left-overs in cooking. They are giving definite training in purchasing clothing materials and food supplies. This departure is most commendable. It is in the direction of the species of training which our times demand, and should become the universal practice of the schools. The same situation is found in agriculture. Farmers are more successful in producing crops and livestock than they are in profitable marketing. The heaviest tax paid by the American farmer is the waste of unmarketed produce which the consumer needs. Farm accounting, insurance, finance, marketing, and purchasing of supplies, are in greater

need of emphasis by the schools than methods of increasing production.

Two Types of Vocational Training

The first type—Psychologically, there are two types of vocational training, distinguished by the character of the learning process and the species of ability developed. The first is that looking to securing an *immediate specialized* efficiency, in which the "control" consists of habits induced by imitation of the master workman. This is the type of training employed in the home to educate girls in housework. The daughters learn to cook, sew, and care for the house by imitating the mother. If the mother is a "good cook" or "neat housekeeper," the girls of the family will be expected to exhibit the same excellence of housecraft. There is no thought of the principles of physics, chemistry, and biology involved in the cooking processes. A certain pastry is wanted. It is known that a certain recipe always obtains the desired result. This satisfies the novice; no one cares how or why the recipe "works." New recipes are "borrowed" or copied from others, not thought out. Another illustration may be observed in the education of the boys on the farm. Ordinarily, the boy is "shown how" to do this and that and the other task, and held to rigid imitation. Any initiative on the part of the boy is rather certain to receive instant condemnation. Immediate results are wanted. The farmer wants no experimenting on his farm. He is satisfied with the accomplishments of himself and his

father, and feels that their methods are good enough for his sons. So, custom controls in matters of crop programs, of soil-culture, cultivation of crops, of seeding and harvesting, and of handling stock. The young farmer knows *how* the several activities of the farm are carried on *in his family,* or *on their "place,"* and he does them rather well, but he does not know why, nor does he know with any certainty whether the methods employed are obtaining satisfactory results from the investment. He is learning by slavish imitation, and if the persistence of the implement salesman and the agricutural agent, together with rivalry with the neighbors, did not inject a new feature into the farm program now and again, the methods would go on from generation to generation without improvement, as may be observed in the backward agricultural districts.

Instances of the first type—The apprenticeship method of teaching trades is another instance of the first type of training. The young apprentice attaches himself to a skilled workman as helper and "to learn the trade." He is expected to "catch on" as rapidly as possible to the methods and devices of the master: which tools to use in a given situation, how to hold them, what movements to make. The candidate in carpentry is told to observe the skilled carpenter, and note which saw he uses for a given cut, for a given kind of wood, how he holds the saw, and what movements he makes in the act of sawing. Having observed these operations, he is directed to imitate them faithfully until "he can do them as well as the master carpenter." This variety of training will be

found in many, if not the majority, of manual training laboratories, and in the prevailing methods of commercial departments of high schools and in the business colleges. These are *apprenticeship* schools; the teacher is the master workman, and the students are apprentices endeavoring to acquire his skill by the process of imitation and simple habit formation. The object in view is fitting the worker in the shortest time to do a specific thing in a specific way—immediate specialized efficiency. The learning process is "deliberate imitation" under supervision, and with little or no concern for the system of principles involved in the activity.

The second type—The second type of technical education is that which looks to a larger mastery of the vocation in which the "control" consists in the mastery of the "theory," and in which a generalized rather than a specialized efficiency is sought. The reader will observe, at once, certain essential differences between this variety of training and that described above. First, the objective is the learning of the trade or occupation in its larger aspects: its intellectual as well as its skill aspects; its social as well as personal. The aim is to understand as well as to do, to understand in order to do; to learn the body of facts and principles involved, and to develop skill in doing by application of this knowledge and insight. In the first type of training, skill is acquired by imitation of operations without question as to the reason for them; in the second type, skill is acquired by rational application of ascertained facts and laws, followed by practice for facility. The first copies

the art; the second thinks it out by analysis and synthesis. Again, in the second type of training, there is not the same demand for immediate results. The learner is willing to take more time because of his expectation of larger abilities and rewards in the end. The third difference is in the nature of the "control" of motor processes. In the species of training first described, the control is a memory image of the model operation; in the second, it is a general concept. The former is derived from memory of how the master executed the movement; the latter is a concept of the movement derived from a consideration of the facts in the case; the former is on the perceptual level, the latter is on the higher level of reason.

In the second type of vocational education, the boy is trained for farming by causing him, as the approach to vocational mastery, to acquire a knowledge of the different soils, their constituent elements, how procured, the normal proportions, the physical conditions necessary to plant growth, the best tools to employ in securing the desired physical condition of the soil. Having this body of data in mind, the boy is then taken to the field and set a series of problems, as: Is this ground physically and chemically adapted to the growth of a crop of wheat? If not, what treatment is necessary to put it into proper condition for a profitable crop? What does the ground need in preparation for corn? For the other staple crops? Outline a five-year crop program which you advise for this particular ground on the basis of the facts which you discover. Such problems lead the pupil to investigate the essential facts. In such exploration

he may need to pause and acquire methods of testing conditions. Through analysis and synthesis of the elements of the situation, the boy thinks out a solution, which, if followed by proper demonstration exercises, will check up his theory and also develop skill of execution. The boy learns how to farm intelligently and at the same time develops his personality. These two phases of growth combine to produce a farm manager, a vocation on a higher level than is produced by the apprenticeship method.

The same procedure is observed in the better grade of home economics instruction. The pupils first make a survey of food materials and their several values, individual and comparative, together with a study of the nutrition of the body in general and under conditions brought about by various employments. With these data in hand they then proceed to the planning of menus. Their courses in physics and chemistry of foods and cookery acquaint them with the physical and chemical changes produced in the processes of cooking, and with the nutritive values involved. On the basis of these insights, the pupils think out recipes, equipment, and so forth. Having mastered the theory of cookery, in the presentation of which they will have had considerable demonstration work, they may then take up laboratory practice for the purpose of attaining skill in manipulation. Even if the girl fails to become a skilled cook, her study will fit her to be an intelligent supervisor of a home.

In carpentry the method is similar. The first task is the study of such matters as materials, mechanical

principles employed in construction, the use and care of various tools, and efficient handling. After this grounding in theory the boy then works for skill, the "control" being the system of working concepts developed in the theoretical study, as distinguished from the imitation of the model performance of the master carpenter in the apprenticeship method of learning the trade. It is obvious that the mastery of the carpenter's trade by the rational method, if the individual possess reasonable ability for leadership, will produce the foreman rather than merely the skilled workman.

Types of Technical Schools

Pedagogically there are three kinds of vocational schools or departments: first, those which give the first or apprenticeship type of vocational training; second, those schools which give the second or rational type of instruction and training; third, those schools and departments which seek to combine the two types of training. Of the first kind, the ordinary "business college" is a very good example. Most manual training departments are also of this variety. The polytechnic schools belong rather to the second group. Here and there are schools which maintain a working relationship with local industries in which the pupil spends half of his time as an apprentice, the other half being devoted to learning the "theory" in the classroom and laboratory at school. Such an institution is an example of the third type.

The Learning Process

The method of instruction and training employed in vocational subjects is determined by the nature of the learning process involved in the subject as modified by the objective. In the first type of training, in which immediate specialized efficiency is the objective, the learning process is simply a systematized imitation of a standardized performance. The control is a system of habits acquired by faithful imitation. The steps in the method of teaching are as follows:

(1) Statement of the thing to be done.
(2) Observation of the model performance.
(3) Supervised practice of this model performance until the standard degree of efficiency has been reached.

In the second or rational type of training, in which the object is the larger mastery of the vocation, with special reference to foremanship, the learning process is more scientific. It consists in the formation of a body of concepts by analysis and synthesis of concrete situations and the application of natural laws, followed by demonstration of the adequacy of these concepts, and by practice for skill, controlled by the theory which the pupil has formed. The steps in the method employed in subjects presented in this manner are:

(1) Statement of the problem.
(2) Analysis of problem to determine the kinds

and amount of data required for the solution.
(3) Acquiring an organization of data into principles.
(4) Factoring of present situation for elements.
(5) Abstraction of elements and comparison of each with principles previously developed.
(6) Formation of working concept, that is, concept of the process or processes to be employed.
(7) Demonstration.
(8) Supervised practice for skill.

Educational Values

In general, the educational values of vocational subjects which involve the first type of training are inconsiderable, aside from their immediate utility and certain disciplines in the quality of workmanship. The subjects which involve or employ the second type of training have larger and more varied values.

Commercial subjects, as ordinarily presented in the high school, are of the first type, and, hence, offer no values beyond their specific utilities, and habits of neatness, accuracy, orderliness, promptness, speed and self-control, which habits may or may not be formed, depending altogether upon the efficiency of the school. Manual training, when presented as of the first type, may be disposed of with the same observation. This judgment may also be recorded with reference to the other vocational subjects—agriculture, home economics and industrial arts—if taught on the apprenticeship plan. If taught by the "rational" method, however, they have many and considerable values which

give them a reasonable parity with other high school studies. They have a large preparatory and introductory value, considerable social and moral value, but possibly less of immediate utility, although this inferiority is not necessary. They certainly have quite high cultural values, and exceptionally high disciplinary values. It is not extravagant to say that, in the hands of a scholarly and pedagogically efficient teacher, the industrial arts, agriculture and home economics may be made as rich in values as the natural and social sciences.

Summary

The place of vocational training in the high school is secure. In the planning of study programs, however, care must be exercised to avoid a number of possible errors: (1) the error of overestimating the economic factor in life, to the neglect of the proper training of pupils for the other relationships and functions of life; (2) over-specialization resulting in "pigeon-holing" the individual; (3) closing the door to subsequent advancement to higher thought-levels; (4) a misconception of the economic process.

There are two types of vocational training, distinguished by the character of the learning process employed and the variety of ability developed: (1) the training looking to immediate specialized efficiency in which the control consists of habits formed by imitation of the master workman, (2) the training which seeks a larger generalized efficiency in which the control consists in the mastery of the "theory."

In the first type of training, skill is acquired by imitation; in the second type, skill is acquired by rational application of ascertained facts and laws.

There are three kinds of vocational schools: (1) those which give the apprenticeship type of training, of which the ordinary "business college" is a good example; (2) those which give the rational type of training, of which the polytechnic and the manual training department are examples; (3) those schools which seem to combine the two types of training.

The educational values of vocational training, other than immediate utility, are almost entirely confined to the work of schools of the second and third types.

References

BRICKER, GARLAND A. "Teaching of Agriculture in the High School," The Macmillan Co., New York.

COOLEY, ANNA M., WINCHELL, CORA M., SPOHR, WILHELMINA H., and MARSHALL, JOSEPHINE A. "Teaching Home Economics," The Macmillan Co., New York.

DAVENPORT, EUGENE. "Education for Efficiency," D. C. Heath & Co., New York.

GILLETT, J. M. "Vocational Education," American Book Co., New York.

GRIFFITH, IRA S. "Teaching the Manual and Industrial Arts," Manual Arts Press, Peoria, Ill.

KERSCHENSTEINER, GEORGE M. A. "Education for Citizenship," Rand, McNally & Co., Chicago.

LYON, LEVERETT S. "Education for Business," University of Chicago Press.

MCMURRY, OSCAR L., EGGERS, GEORGE W., and MCMURRY, CHARLES A. "Teaching of Industrial Arts in the Elementary School," The Macmillan Co., New York.

ROBINSON, CLARENCE H., and JENKS, FLOYD B. "Agricultural Instruction in High Schools," U. S. Bureau of Education Bulletin, 1913, No. 6.

SNOWDEN, JAMES H. "Meaning of Education," Abingdon Press, New York.

WRIGHT, CARROL D. "Industrial Evolution of the United States, Charles Scribner's Sons, New York.

CHAPTER XVIII

THE TRAINING OF ÆSTHETIC JUDGMENT

Three objectives in art education—The teaching of the fine arts may be addressed to any one of three objectives. It may seek to give a mastery of the technique, an understanding of the theory of the art, and facility in the handling of the elements of composition. This variety of instruction and training produces the technician. Or, the objective may be the development of the composer and producer, the artist who creates or reproduces. In the third place, the aim may be to develop the power of appreciation, including æsthetic judgment. The result of the first species of art-teaching is the science of art and art processes; of the second, the creative and interpretative artist; of the third, appreciative ability and cultivated taste. To a certain extent each variety of ability involves the other two, but the correlation is not necessary, nor very generally present. The person who has attained a high degree of technical ability may as likely as not possess a low degree of taste. The creative artist may be wholly lacking in æsthetic judgment, and it is possible to train the individual to a high degree of æsthetic judgment and enjoyment without giving him an extensive training in the technique of art, or skill in execution.

Appreciation of chief importance—While the high

school should provide for all three varieties of art training, the third, appreciation, is of chief importance. Enough of the theory of music, graphic representation, architecture, and so forth should be given to every high school student to make him reasonably intelligent with reference to these matters as they occur in everyday life. There is a body of fact involved in art which is commonplace in the thought and conversation of intelligent people, and which should be included in the education of the individual, purely as a matter of preparing him for ready adjustment to his social environment. Enough practice in execution should be given to enable the individual to master the forms of the arts as means of expression. Line and color constitute a language which the individual will find necessary for the proper expression of his thought in the ordinary activities of the average man. Singing is so general a mode of expression that the man who does not sing must stand mute in many of the most vital situations in his life. The "language" of the arts has a practical utility for every life which can not well be lost. Enough of training is demanded to give the individual possession of these supplemental languages.

The majority should be trained for art consumption—But the great majority of persons are consumers of art rather than producers. That is, they are employed in selecting house-plans; choosing wall-coverings, draperies, rugs, furniture; choosing the colors for painting the house, planting flowers and shrubbery, laying out walks; selecting clothing materials; choosing modes of entertainment—doing hun-

dreds of things each day involving the exercise of æsthetic judgment. The American people expend billions of dollars annually on beauty, or in the pursuit of the beautiful. These billions are wagered on the æsthetic judgment of the average man and woman. With the vast majority the venture is a matter of trial and error. Women purchase elaborate toilets which looked well on others, only to find that "the style does not suit" the purchaser. The outfit disappoints, offends, and is cast aside to make way for another wager. The literary, musical and dramatic worlds are mostly ruled by vogue rather than merit for the reason that the average man is not able to judge of these matters for himself with any assurance of accuracy. He, therefore, follows the judgment of those who look as though they ought to know. The masses of the people are governed in their activities and relationships which involve the fine arts wholly by mob-mindedness. Their test of merit is, "Everybody is reading it," or "Everybody wears it," "Everybody goes," or "All the fine people go to hear it." Surely the public high school can render no greater service than to give to the youth of America that training which will make the next generation as accurate in its æsthetic judgment, and as independent, as this generation is in motor mechanics and trading. We have alluded to the national economic aspect of the vast expenditures of our people for various forms of art, the wisdom of which is dependent upon the adequacy of the æsthetic judgment. It is also true that the largest expenditures are for the least artistic things. The gorgeous and gaudy articles are

more costly than the really valuable ones. One needs but to give a look at the houses and gowns and playthings of the new-rich. There is no greater economic waste than the fortunes paid for the ugly and common and low, in the name of literature, drama, architecture, dress, polite intercourse and music.

Vulgarity and morals—We have also, elsewhere, called attention to the fact that it is the pleasure life of the people which, more than any other one factor, determines their moral character. Nothing is more debasing than vulgarity—vulgarity in architecture, furnishings, dress, music, drama, as well as in thought and deportment. There is nothing more refining than beauty. The man who has acquired the ability to perceive the truly beautiful in the varied forms in which it is manifest has also acquired that refinement of thought and impulse which will lift him above the coarse and ugly. When mire becomes ugly he takes another path. And the fact must not be overlooked that every man has "an art life." The man who thinks that he does not like music means simply that he does not enjoy the kind of music which appeals to his friends. Somewhere between the tum-tum of the savage's rude drum and the finished symphony is a variety of music which fills him with joy. Every man loves poetry of some order of merit between the illicit verse of the back alley and the lofty lines of the Shakespeares and Miltons. Every man likes pictures somewhere between the vile expressions of bestiality and the madonnas. The persons who enjoy the same types of music, verse and picture are his kindred spirits, to whom he flocks and with whom he has in-

tercourse of soul. Two young men of equal ability pursued the same courses through preparatory school and college. They left the commencement platform with equal prospects. One of them had learned to find enjoyment in jazz music, forbidden pictures, and salacious verse. He died recently of alcoholic insanity. The other young man spent his life in the same city. He traveled the same streets, saw the same people, experienced the same "calls" from his environment. But he had found joy in the best of literature, in good music, and in real art. The sights and sounds which had captivated and hurried his friend to ruin were repulsive to him; he ran from them. He followed the flag of his soul elsewhere because he had learned to find beauty elsewhere. He also died recently, honored the world round. Æsthetic appreciation is a direct approach to ethical attainment.

Training for enjoyment and discriminating judgment—Teaching of art for appreciation should seek to accomplish two things: (1) training the pupil to perceive and enjoy beauty in Music, Literature, Architecture, Drama, Painting, Drawing, Sculpture, Landscape, Dress and Deportment; (2) developing refined taste in each of these forms of art, and discriminating judgment. The development of æsthetic judgment involves (a) the establishment of norms for comparison, and (b) practice in a method of analysis, comparison and synthesis leading to judgment of the artistic value or rating of the selection.

How norms for judgment are established—Norms for comparison are established by familiarizing the pu-

pil, under pleasurable conditions, with selections which are accepted by competent authority to be of classical quality or of such merit as deserve preservation. Literary judgment rests upon thorough acquaintance with at least a few productions of each type which have been accepted by literary authorities and tested by a long period of approval by persons of known excellence of literary taste. This basis of judgment is more effective if the individual has a thorough acquaintance with a small number of the best productions than if he has a superficial knowledge of a large number of books. The books we know and so well enjoy that we love them, become to us standards of literary excellence. By them, all other books are judged. The task and the opportunity of the teacher of literature is to lead the pupil to live with a small number of the choicest books until they have become a part of him, his major premise in evaluating all other literature. They are to his reading what the cornerstones of a survey are to the engineer. They constitute his measuring scale. Norms for musical judgment are established in the same manner, namely, by so completely familiarizing the pupil with a small number of great musical selections that he instinctively employs them for measuring the worth of other music.

Taste—Taste is a by-product of habit. Literary taste comes of habitual association with a type or grade of literature. One forms the habit of liking the sort of thing with which he is long associated. Musical taste is chiefly a matter of continued exposure to a given kind of music. One gets the jazz habit, or one

forms the habit of responding to good music. Refinement is the plane above the brute level upon which a man finds the desired satisfactions of his nature. Refinement is secured by imitation of others who have become habituated to the higher level of behavior. In some measure it is a matter of unconscious surrender to suggestion. Imitation, suggestion, habit, are the key-words in the cultivation of taste.

Good judgment requires practice—To the establishment of norms of comparison must be added practice in the evaluation of art products in order to develop facility of judgment. One becomes a judge of books by much practice in comparison of books with standards one has chosen. Pupils readily develop the habit of judging the quality of music, if they are set to comparing compositions analytically with the norms of judgment and attain surprising ability in this. An "eye for architectural excellence," or for choice of clothing materials, or mural decorations, is easily developed by supervised practice in application of the norm of comparison and a few principles of technique. To be sure, intelligence and continuity of practice here as elsewhere are necessary to the attainment of expert ability, but with even their limited resources the high school music and art departments may accomplish much in stimulating higher and more active taste in the community.

Pupil needs method of analysis—The pupil will need a method of attack, or of analysis and synthesis, to enable him to approach the study of a piece of art, music or literature independently and systematically. Schemes for the study of different types of literature

have been suggested in the chapters on English. A similar scheme of study has been employed in the study of pictures with evident success, and will be suggested further on in this discussion. With slight modification this scheme may also be used in the study of other art forms.

The reader is referred to the chapter on Mental Processes for the discussion of the psychology of appreciation. It is sufficient for our immediate purpose to recall that to appreciate means to enjoy, to feel inherent worth, and to be devoted to or loyal. The basis of appreciation is the emotional experience arising from the motor responses awakened by the object of appreciation. Appreciation of a musical composition develops from the feelings evoked by the "physical play," or motor response, called forth in the hearer by the music. If this response is definite and allowed free scope, the accompanying feeling will be deeper and more likable. The mind instinctively regards anything as valuable, and worthy of personal support, which gives pleasure. That is, all art was originally a mode of behavior or a means of regulating behavior, and is most readily entered into through stimulating in the pupil those motor experiences with which the art form was originally associated.

Dramatic Work in the High School

Literature shares with music the position of prominence in the art life of the people. The high school and college have reached an excellence in the teaching of literature which has not been approached in the

teaching of other arts. There is possibly more discriminating taste in literary matters than in other forms of art, due to the excellence of the work of the schools and of literary clubs. One reason for this is the more tangible character of literary form and content, and the fact that English teachers have been readier to accept pedagogical suggestion. In recent years the schools have revised their program to give larger attention to training in conversation and public speech. This new feature of the English course is most commendable and should receive the fullest encouragement. In some schools, also, formal training in dramatics has been introduced with immediate benefit. Dramatic portrayal is the direct natural reaction to the reading of a selection of literature and proves, for that reason, an invaluable aid to the pupil in securing the fullest understanding and appreciation of the selection. One gathers much of the thought and feeling of Hamlet from reading the play to oneself; one gathers more by witnessing the production of it by an artist on the stage; but one gets the fullest grasp of its content by playing Hamlet. Dramatic training has, therefore, an important function in the English course as a supplement to the study of literature.

There is another and, possibly, larger function of school dramatics of the proper kind, in developing a wholesome dramatic taste and dramatic judgment. Those pupils who are permitted the opportunity to participate in well-chosen school plays under competent direction acquire a taste for the finer things in dramatic art which makes them discriminating in their

patronage of public theatricals. The same result is experienced in private theatrical clubs. The debased stage is explained by the conscienceless greed of purveyers, and the utter lack of training of the masses in dramatic judgment. The cheap and ugly are foisted upon the public because the public has had no opportunity for the training which would enable it to judge for itself and express its demand for better things. What larger social service, among the many possible contributions, can the high school render than to prepare its students to resent the exploitation of the public by these persons whom we have unfortunately permitted to secure a monopoly of the American stage?

The Graphic Arts

The psychology of drawing and painting is simple. With the race, and with the individual, drawing begins in the effort to represent things as they are remembered, and develops into the ability to represent things as they are perceived. Two elements are employed. At first, the line only is used to represent pattern and perspective. Later color is introduced, first to secure contrast, and later to show perspective. In graphic art, appreciation is governed chiefly by the lines taking such direction as permits the eye to follow with the least effort, and by symmetry or balancing of the content of the field of vision. The modern slang phrase "Easy to look at," expresses the fundamental principle of the psychology of art appreciation.

The two classes of pupils—Two classes of pupils are to be served in the high school. There are the few gifted individuals who deserve the opportunity to cultivate their talents intensively, and for whom the course of study should be organized to develop grasp of theory, including the history of art and technique, and skill in expression or production, as well as appreciation. There is the far larger class, including properly all other students in the school, who possess no particular talent for artistic expression, but who will have in fact far larger need of artistic judgment than the few who are specializing in art activities. They need training for consumption of art goods while the first class is being trained for production. This second class really has greater need of art training for its particular needs than has the first class, but for the most part the schools have utterly failed to supply its need. What this class needs is enough of facility in handling pencil and brush to supplement the individual's vernacular in his effort to express his thoughts; elementary drawing purely as language and with no purpose of making an artist of him. The larger thing which he needs, however, is the training which will give him good judgment in selecting his neckties and making the numberless other choices involving the exercise of æsthetic judgment. The point which this chapter is endeavoring to make is that a democratic education will provide those varieties of training which will enable the common man to think and choose for himself intelligently. No form of judgment is required of the average man and woman more frequently, and with more consequence to

his happiness and moral and material welfare, than the æsthetic judgment, and particularly judgment of art values. Therefore, if the high school is to be democratic in the department of art instruction it must provide a course of instruction and training which will give to all of the pupils of the school at least an elementary training in this variety of judgment.

This course of training for artistic judgment will seek to fix in the pupil's mind a set of norms as standards of comparison. There are certain principles of composition of lines and colors which he must understand. Most of all, however, he needs practice in the judging of the art values of dress-materials, furniture, house-furnishings, color-schemes of houses, architectural features, landscape plans, and the other features of the life of the community which involve art judgment. Much of the work in such a course should be done in the field. It should be made as immediately practical as possible.

Rich content of graphic art—Graphic art is second only to literature in the wealth of its content. Much of the world's greatest thought and emotional experience is stored up for us in the art classics. In a well-balanced education this content has as much place in the program of study as literature. The art course which omits the introduction of the pupil to the treasures of the world's galleries is as imperfect as the course in English which omits any study of literary classics. The high school graduate has the right to a general acquaintance with the great pictures of the world, and to an intimate acquaintance with a few chosen to be his friends, in his effort to evaluate other

pictures. The need of this service on the part of the school is beyond question to one who has observed the collection of stuff found in the average middle-class home.

Art products offer a field of interpretative study only less valuable than literature, and only slightly less tangible. There have been many schemes suggested for picture study which are feasible. The following adaptation of the form for study of a literary classic has been used in picture study with decided success.

Form for Study of a Picture

I. The title? Why chosen?
II. The meaning of the picture.
    1. The human figures in the picture:
        Who are represented?
        What kind of people are they?
        What are they doing?
        What are they thinking?
        How do they feel?
        How are they dressed?
        To what time and place do they belong?
        What is the central figure?
    2. Other objects and elements introduced:
        What objects other than persons are introduced?
        Time of day, month, season, shown in the picture?
    3. Of what was the artist thinking in painting this picture?

How did he feel with reference to it?
What was his purpose—to instruct?
to entertain?
to enforce a lesson?
Are the expressions, action, pose, kind of people, and dress of persons appropriate for this purpose?
Are the other objects and elements appropriate for this purpose?

III. The Composition:

1. What kinds of lines are used? Are they true? Are they pleasing? Are they harmonious?
2. What colors are used? Are they true? Are they harmonious?
3. Are light and shade employed? Where disposed? How do they affect the lines? How do they affect the colors?
4. Is the perspective true as to lines? As to colors? As to light and shade?
5. Does the picture properly fill the space? Are the objects so distributed as to balance properly?

What contrasts are employed { of persons? / of setting? / of lines? / of color? / of light and shade? }

IV. Does this picture please you? Why?

V. What do you know of the artist? What other pictures has he painted?

VI. What other pictures does this one suggest? In what respects?

Portions of the preceding outline have been employed in the study of individual trees, of bits of scenery, and of landscape effects, sculpture and architectural subjects. The teacher is expected, of course, to make such modifications as the nature of the subject requires. The important thing is to supply the pupil with a definite mode of attack which includes the consideration of the principles of perspective, coloring, symmetry, and pattern.

Music

Music was developed originally to regulate movement in the march, the dance, or other group action. The basic element is rhythm, and the music of primitive tribes is confined to this element. Other elements were introduced in the following order: Accent, Tone, Motif, and Harmony. This order of introduction gives the natural sequence of presentation of the elements of technique. Musical appreciation is based in the "physical play," or motor reaction, stimulated in the hearer. This fact is readily demonstrated by experience with selections which differ in the degree of motor reaction called forth, and gives the teacher the clue to the most direct method of developing appreciation. Each selection calls out an appropriate motor response. If this response is easy and har-

monious in its various movements, the effect is pleasing. Information with reference to the history of the composition, the experience of the composer in the composition of the production, and any other facts which go to give it standing as a mode of expression, will help to arouse a favorable attitude. The essential thing to bear in mind is that the selection is designed to secure certain regulated movements in the audience, and the problem of the teacher is to encourage and give free course to these natural reactions. The dance, in the larger meaning of the term, the march, the concert or co-operative movement of the group, are the forms which this reaction takes, and the emotional experience accompanying the reaction is the basal element in appreciation. This fact is suggestive in connection with the effort to control the modern dance. The "low" dance is the immediate result of the "jazz band" which is a reversion toward primitive types of music. In return, indulgence in the primitive dance fosters appreciation of "jazz" music. Obviously the most direct method of dealing with the matter is to provide a higher type of music at social functions.

The three types of musical instruction—There are three types of musical instruction: the training which seeks to produce the technician, that which develops the composer, and that which aims at the training of the listener. The last type of training is of chief importance in the high school. That is, the type which should prevail is the training of the majority who will "consume" music, rather than the few who may become producers; training for musical appreciation

and judgment rather than for execution. This course will involve enough of theory to make the pupil intelligent in discussion, enough of practice in singing to enable the individual to employ this mode of expression in ordinary situations, and enough technical mastery to enable him to read music and identify elements of composition. The principal effort should be devoted to cultivating such intimate acquaintance with a limited number of musical masterpieces that he may acquire a taste for the worth-while music, and a set of norms for musical judgment. As suggested above, in the study of a masterpiece the pupils should not only be informed of the history of the production and its psychological aspects, together with the facts of the language employed, but they should be led to reproduce the motor reactions which the selection is disposed to call forth. This dramatization of the production has the same significance in musical culture as in the study of literature.

Considerable attention may well be paid to the general survey of musical classics and their connection with the general history of their times and places. One should know the world's music as he knows its great literature and its masterpieces of art. Sacred music should receive special consideration with a view to elevating taste in the matter of church music. Special attention should also be given to the popular stuff with which the country is flooded, looking toward helping the young people to make a proper classification of such material. The cultivation of taste for real music and the ability to pass adequate judgment upon the quality of compositions is of the utmost value to

the public. The high school has a great opportunity for distinguished social service in setting wholesome musical standards for the community.

In all of the foregoing discussion the thought has been that each of the arts has a content and a language which has a necessary place in the scheme of secondary training; that the individual has the right to sufficient training in each of the arts to explore his abilities, and to cultivate any special talent thus revealed; but that from the standpoint of social progress the important function of art teaching in the high school is the development of æsthetic judgment and high-level taste. This æsthetic judgment and appreciation of the higher types of art products has many values: an economic significance, a large cultural value, and an immense moral influence.

The following excerpt from the outline of instructions to teachers of music issued by the Department of Public Instruction in the State of Indiana is pertinent at this point in the chapter:

"Besides vocal music, the pupils may under favorable conditions become acquainted with some good standard instrumental pieces. In most high schools some of the pupils play the piano or other instruments skilfully, and the teacher will do well to have such pupils play for their fellow pupils.

"The use of music reproducing instruments is heartily endorsed and is coming into prominence in the schools as in the home. A piano-player is of great value in the presentation of the best compositions of the greatest composers and adds greatly to musical appreciation, which is a part of musical and cultural education.

"The Graphonola, Victrola, and the Edison Phonograph

are especially valuable in that they are portable and easily taken from room to room. The range of selections covers instrumental, vocal, orchestral, and band compositions.

"Courses of instruction may easily be arranged so that the work of a special composer or group of composers may be studied and appreciated. In this way musical taste may be developed in a way impossible before the development of these instruments.

Summary

The teaching of art may be addressed to anyone or all of three objectives: (1) a mastery of technique, of the theory of the art, and the principles of composition; (2) the production of the artist who creates or reproduces; and (3) the development of appreciation and training of æsthetic judgment.

The result aimed at in the first case is the science of art and art processes; in the second, the creative and interpretative artist; and in the third, appreciative ability and cultivated taste. Each variety of ability may involve the other two, but the correlation is not necessary, nor so generally present as is usually assumed.

While the high school should provide for all three varieties of art training, for the great majority, and socially, training for appreciation and judgment is of chief importance.

The "language" of the arts has a practical utiltiy for every life which cannot well be lost. Enough training is demanded to give to the individual possession of these supplemental languages.

The great majority of persons are consumers rather

than producers of art products. They need to be trained in their judgment of values. Such training would lead to enormous economic betterment of the masses.

The moral character of the people is greatly influenced by the quality of their pleasure life. Nothing is more debasing than vulgarity—vulgarity in architecture, furnishings, dress, music, drama, as well as in thought and deportment. Beauty is refining. The æsthetic standards of a community have the utmost moral significance.

Teaching art for appreciation involves: (1) training of pupils to perceive and enjoy beauty in the various arts, and (2) development of refined taste in each.

Norms of art judgment are established by familiarizing the pupil, under pleasurable conditions, with art products which are accepted by competent authority as deserving preservation.

Taste is a product of enjoyment and habit. Æsthetic judgment is strengthened by giving the pupil practice in the use of a method of criticism.

The primary object of high school dramatics is the improvement of dramatic taste.

The school is expected to provide courses in the graphic arts for the development of the few who have talent for these modes of expression, but, on the whole, it renders a larger service in providing the student body with facilities for an enjoyable acquaintance with the great masterpieces of painting, sculpture and architecture, just as the music department will make the world's classic musical compositions familiar.

The plans for the analytic study of literary master-

pieces may with slight modifications be employed in the study of pictures.

Possibly the best particular social service the high school can render is the cultivation of taste for real music and the ability to pass adequate judgment upon the quality of musical compositions.

References

ANGER, "Elements of Harmony," Boston Music Co., Boston.

BALTZELL, WINTON J. "Complete History of Music," Theodore Presser, Philadelphia.
Biographies of Continental and American Composers.

COOKE, JAMES F. "Standard History of Music," Theodore Presser, Philadelphia.

DE GARMO, CHARLES. "Principles of Æsthetics," The Macmillan Co., New York.

EARHART, WILL. "Recent Advances in Instruction in Music," U. S. Bureau of Education Bulletin.

ELSON, LOUIS C. "Theory of Music," N. E. Conservatory Music Store, Boston.

EMERY, STEPHEN A. "Elements of Harmony," Arthur P. Schmidt, Boston.

GORDON, KATE. "ÆSTHETICS," Henry Holt & Co., New York.

HAYWARD, FRANK H. "The Lesson in Appreciation," The Macmillan Co., New York.

HENDERSON, WILLIAM J. "What is Good Music?" Charles Scribner's Sons, New York.

KREHBIEL, HENRY E. "How to Listen to Music," Charles Scribner's Sons, New York.

PARKER, DEWITT H. "The Principles of Æsthetics," Silver, Burdett & Co., Boston.

RICHTER, ERNST F. "Manual of Harmony," Oliver Ditson Co., Boston.

SEASHORE, CARL E. "The Psychology of Musical Talent," Silver, Burdett & Co., Boston.

TURNER, W. J. "Music and Life," Dutton, New York.

VICTOR TALKING MACHINE COMPANY. "Music Appreciation for Little Children."

UPTON, GEORGE P. "Standard Operas," A. C. McClurg & Co., Chicago.

VANDYKE, JOHN C. "How to Judge a Picture," Methodist Book Concern, New York.

CHAPTER XIX

PHYSICAL EDUCATION OF THE HIGH SCHOOL PUPIL

Physical deterioration of the American people—One of the most hopeful aspects of modern education is the increasing, intelligent concern with reference to the physical development of our boys and girls. That this interest is belated is manifest in the alarming conditions which the more accurate information of recent years reveals. The reports of the medical service of the army in the late war indicate that American physical manhood has seriously deteriorated. The following excerpt from an official statement should cause us to realize how serious the situation is. "Some will argue that we need lay no special emphasis upon physical training, because through past years men and women have reached mature age in good health. This statement is based upon the general appearance of the American people. However, appearances are quite deceiving. Sixty-eight per cent of our young men, when put to the test, fail to meet the nation's approved physical requirements. Many contain the beginning of degenerative diseases, such as apoplexy, heart trouble, diseases of the veins, arteries, kidneys, and other vital organs. What has been said concerning the young men is also true of the young women."

It is true that the death rate has been reduced, but

this is through improved sanitation, and the better control of communicable diseases. The death rate due to degenerative diseases has increased. The average span of life is longer, but because of the reduction of infant mortality. The death rate above fifty years of age is alarmingly increased. Infant mortality is due chiefly to malnutrition and communicable disease; adult mortality to degenerative disease, that is, to the breaking down of tissues and functions, resulting from low vitality. "Men and women die in the prime of life because their vital organs are not strong." Another excerpt from the Indiana State Manual on Physical Education, Bulletin No 36, is in point. "Vitality, or organic power, is fundamental for physical and mental efficiency. The vital organs are best developed through the muscular activities that are common to all healthy children. The child runs and jumps in order that the heart, veins and arteries may become strong, that the lungs may be fully developed, that the nerve-centers may be justly co-ordinated, and that other vital organs may function properly. If we take these activities away from the child and the youth; rather, if we do not insist that the child and youth engage in vigorous muscular activities, then the inevitable result must follow; indeed, we have the result, namely, an adult race of men and women with weak vital organs who succumb easily to the attack of degenerative diseases."

Physical education for the preservation of the American stock—A more general and systematic physical education manifestly is necessary for the preservation

of the American stock. A people can be no better than its arteries; no better than its vitality. Little progress has been made if we reduce infant mortality, only to increase the number of persons with insufficient vital power to combat the foes of health. Unless the American people can maintain a degree of vitality in excess of the minimum requirements of average life, "the blood will run out." Man has no exemption from the biological laws which govern the upkeep of farm herds and grains. A herd whose vitality is not kept well above the existence level will vanish by exhaustion.

Health the greatest material asset—Physical health is the nation's greatest material asset. This is true for the reason that physical health conditions every human activity and situation. Social efficiency is, fundamentally, a matter of physical development. The worker, whether the manual laborer or the highly specialized professional man, works by means of his body. The body is the tool of the mind. It is the instrument with which the mind relates itself to its environment, and with which it executes its will on this environment. The street-cleaner works with his body, the lawyer pleads his case with his body, the physician uses nerve and muscle, the preacher urges the divine law through the instrumentality of voice, pose and gesture. The brain-worker uses vital energy. Blood is the essential partner of mind in every human enterprise. The quantity and quality of blood supply is the measure of social efficiency. The nation cannot rise higher than the ability of its men and women to carry the ordinary loads of life without

undue fatigue. At the present time American manhood is using up its vital capital. Our native stock is deteriorating; our young men are not physically capable of standing up under the burden and strain of modern industrial and professional life. Our young women are less capable of performing the normal duties of wifehood and motherhood without exhaustion. Our productive and reproductive powers are both threatened. The only source of safety is in a proper system of physical education.

Human life on a physical basis—Psychology has shown us that learning as well as doing is a psychophysical process. The efficiency of the pupil in the classroom depends upon his supply of vitality. His susceptibility to impression and his power of retention are conditioned by the plasticity of his brain tissue. His rate and vigor of reaction depend on the quantity and quality of his blood supply. These, in truth, depend upon the vigor of heart, lungs, liver, stomach, arteries, and eliminating organs, and these upon the use of the muscles while the pupil is growing up. Physical training is valuable as an adjunct to the classroom, increasing the learning and memory-functions of the pupils.

Character grounded in physical stamina—In another chapter stress is laid upon physical development as a condition of character education and personality. The sickly pupil, ordinarily, sees life and its relations through distorted lenses. His perspective is twisted by self-consciousness, and his vision colored by his bodily feelings. Force of personality is partly produced by the definiteness of moral principle, but

more largely by the degree of vitality. The first phase of moral education is a vigorous, well-balanced body development.

National stability is largely rooted in the general happiness of the people, and happiness is the first fruit of health. The glow of good feeling which accompanies normal vital functions is the physical basis of personal contentment. This, in turn, is the emotional basis of social stability.

Objectives in the High School

The objectives of physical training in the high school are three:

1. Physical development, with cultivation of proper insight into the laws of health, the establishment of proper physiological habits, the co-ordination of mind and body, the development of dexterity of body.
2. Recreation.
3. Moral training.

The physical exercises required of the pupils should be accompanied by instruction in the underlying principles and the results to be secured. The course in hygiene should be co-ordinated with the program of exercises in the gymnasium. The physical "work-out" will demonstrate the significance of the hygienic instruction, and the insights into the laws of correct living will provide an adequate motivation for the work of the gymnasium. Further, it is as important

to assure the continuation of good physical conditions through the establishment of proper habits of living as it is to give the pupil normal development through his school years. These habits will include sitting and standing posture, eating, drinking, sleeping, breathing, daily physical exercise, and the eliminating functions.

The play impulse—Play is a prominent factor in normal life. In childhood and youth it is the primary activity. Play-activity is fundamentally motor. "All normal boys and girls are interested in some form of physical activity. This interest, when expressed in wholesome gymnastic exercises and games, tends to make the body strong and keep it well. To run, to jump, to kick, to swing, to throw, to catch, to yell, in general to play, is natural to all children. Nature demands that children do such things, in order that they pass safely through the motor active period of life. So strong is this desire for physical activity that children will play under the most discouraging conditions and dangerous surroundings." The play instinct must be satisfied, and finds its natural expression in games which are predominantly motor. The program of physical education must make large provision for this recreational element. So strong is the native demand for play that the best results are secured by organizing the developmental exercises into games and contests. This involves the provision of school athletics controlled in accordance with the principles of physical and moral training.

Since the play-life of youth is so large a factor in the making of character, and at the same time is nat-

urally disposed to take the form of physical activity, the character values should always be held prominently in mind. It is not extravagant to say that the physical director has more intimate contacts with the student body, and more influence in determining their moral ideals than any other member of the faculty. His responsibility is proportionate, and the selection of the staff of coaches, gymnasium leaders, and other assistants in this department, one of the utmost consequence for the community. As observed elsewhere, the person who controls the recreation of the community controls its morals. The physical training staff should be employed on an all-year basis, and given charge of the physical play-life of the community.

Phases of Training

There must, therefore, be three phases of training provided:

(1) Body-building and hygiene.
(2) Corrective gymnastics.
(3) Recreation.

The first phase will aim at securing standardized development of the student body, and proper instruction in the principles of hygiene. The second phase aims at giving individual attention to those pupils who are defective in development. This special attention implies that all pupils have been given a standard examination, and that all who are not reasonably normal in development have been given a prescription

to be carried out in individual work or in small groups. To do this individual work properly requires specialist training on the part of the director; the cooperation of the director and the school physician; and that the student who applies for an excuse from physical training shall be given individual training rather than exemption from the one thing of which he is in greatest need.

The Course of Training

The program of physical training will comprise:

(1) Physical examination of all pupils, and classification with reference to physical ability and needs rather than by mental development or physical age.
(2) Graduated progressive gymnasium exercises.
(3) Organized athletic sports, including aquatics.
(4) Application of physical efficiency tests for the purpose of proper motivation as well as measuring of results.

The physical examination, which should be made by a specialist, should include the condition of vital organs and their functions, motor-ability, height, weight, and scope of recreational activity. Individual records should be kept by both pupil and instructor, with notation of deviation from norms. This examination should be repeated from time to time in order to measure development, and the records should be corrected accordingly. There are many acceptable manuals of instruction in hygiene available, and like-

wise quite satisfactory manuals of gymnastic exercises. Suggestions are offered at the end of the chapter.

The practice of some schools to incorporate sex instruction in the course of physical training and hygiene is of exceedingly doubtful wisdom, and is not here recommended. Such courses are too generally suggestive to the youthful curiosity and disposed to inflame morbid imaginations. The most effective sex-training, after all, is to fix the youthful heart upon the attainment of perfect physical development, together with the ideals of chivalry.

Athletic sports are fixed for the high school by convention. Football, basketball, baseball, track, tennis, swimming, diving, and various indoor contests, with proper adaptation to the ability and development of high school youth, are all legitimate in the high school athletic program. Possibly the most questionable of the several sports named is basketball for the reason that it offers strong temptation to overstrenuous playing, and to a prolonged season. With sensible coaching and management of contests, football is a good high school sport. Two dangers must be constantly met in high school athletics: (1) the neglect of the mass of students in order to concentrate the resources of the school upon a small squad of able players; (2) over-training of players, and specialization. Both of these dangers arise from the very nature of interscholastic athletics, thus raising very emphatic question as to the wisdom of such contests. The small advantage in the form of school spirit does not at all offset the grave losses to the student body.

Efficiency Tests

In order to give pupils a definite objective toward which to work, and also a means of determining the degree of improvement secured, a system of standardized physical measurements has been devised. These have been found to have the same educational value as the measuring scales in academic subjects. The use of this physical scale may also be made to stimulate zeal for the work of this department, which quite generally becomes irksome without some material objective, by preparing an emblem of physical efficiency to be awarded to each student who reaches the norm for his class. The following norms have been standardized:

Physical Norms for High School Freshmen and Sophomores

(Or for ages of 14 years to 15 years 11 months)

I. For boys (Must qualify in ten events).

Event	*Required Record*
Chest expansion	3 inches
100-yard dash	13 ⅘ seconds
Basketball goal-throwing	5 goals in 10 throws
Basketball overhead-distance throw	29 feet 1 inch
League baseball accuracy-throw, distance 60 feet	3 hits in 7 throws
League baseball running-catch, distance 90 feet	3 catches in 7 throws

Running broad-jump	13 feet
Running high-jump	3 feet 11 inches
Punting football	71 feet
Putting 12-pound shot	23 feet 8 inches
Running, hop, step and jump	28 feet
Pull-up	6 times
Standing broad-jump	6 feet 6 inches
60-yard dash	8 seconds

II. For Girls (Must qualify in eight events).

Event	*Required Record*
Chest expansion	3 inches
75-yard dash	14 ⅖ seconds
Baseball accuracy-throw, distance of 40 feet	3 hits in 7 throws
Baseball distance-throw	53 feet 6 inches
Baseball running-catch, distance 69 feet	3 catches in 5 trials
Rhythmic plays	4 plays
Walking not less than 3 miles nor more than 5 miles	6 walks per semester
Running and catching; rope 10 feet high, 30 feet from starting line	22 seconds
Volley-ball serving	3 in 8 serves
Swimming	30 yards
Indian club race, or potato race	28 seconds 39 seconds
Basketball goal-throwing	3 goals in 6 throws

Balancing, beanbag or book on head	24 feet in 2 trials

Physical Efficiency Norms for High School Juniors and Seniors

(Or for ages of 16 years to 17 years 11 months)

I. For boys (Must qualify in ten events).

Event	*Required Record*
Chest expansion	3-½ inches
100-yard dash	13-⅖ seconds
League baseball-throw	180 feet
Punting football	81 feet
Putting 12-pound shot	28 feet 9 inches
Running broad-jump	13 feet 6 inches
Running high-jump	4 feet 1 inch
Running, hop, step and jump	33 feet
220-yard low hurdles	36-⅗ seconds
One-mile run	5 minutes 43 seconds
10-mile walk	3 hours
Pole-vault	7 feet
Swimming	50 yards
Pull-up	9 times
Running high-jump	4 feet 4 inches
220-yard dash	28 seconds

II. For girls (Must qualify in eight events).

Event	*Required Record*
Chest expansion	3-½ inches
75-yard dash	15-⅖ seconds

Flag race	20 seconds
Baseball accuracy-throw, distance of 25 feet	3 hits in 7 throws
Baseball distance-throw	55 feet 6 inches
Baseball running-catch, distance 70 feet	4 catches in 6 trials
Push-up	5 times
Rhythmic plays	4 plays
Swimming	50 yards
Walking, not less than 3 miles nor more than 5 miles	6 walks each semester
Running and catching; cord 10 feet high and 30 feet from starting line	20 seconds
Basketball round-arm distance-throw	42 feet
Volley-ball round-arm distance-throw	44 feet
Volley-ball serving	3 serves in 5 trials

Summary

A more general and systematic physical education is necessary for the preservation of the American stock, as well as the condition of physical and mental efficiency. Man has no exemption from the biological laws which govern the upkeep of farm herds and grains. A herd whose vitality is not kept well above the existence level will vanish by exhaustion.

Physical health is the nation's greatest material asset. Social efficiency is fundamentally a matter of

physical development. Human life is on a physical basis.

The character of the individual, and of the people, is grounded in physical stamina. Happiness is the first fruit of health, and national stability is largely rooted in the general happiness of the people.

Recreation, also, is a legitimate objective in the program of physical training. Play is a prominent factor in normal life. Play-activity is fundamentally motor. The physical program, therefore, must make large provision for the recreational element.

The phases of physical training to be provided are: (1) general body-building and hygiene, (2) corrective gymnastics, and (3) recreation.

The program will comprise: (1) the physical examination of all pupils, (2) graduated progressive gymnasium exercises, (3) organized athletic sports, including aquatics, (4) application of physical efficiency tests for the purpose of proper motivation as well as for measuring results.

References

ANGELL, "Play," Little & Co., New York.

"Athletic Badge Test for Boys," Playground and Recreation Association of America.

BANCROFT, JESSIE H. "Games for the Playground, Home, School and Gymnasium," The Macmillan Co., New York.

BURCHENAL, ELIZABETH. "Dances of the People," G. Schirmer, New York.

BURCHENAL, ELIZABETH. "Folk Dancing as a Popular Recreation," G. Schirmer, New York.

CAMP, W. C. "Athletic Games," Charles Scribner's Sons, New York.

CRAMPTON, CHARLES W. "Pedagogy of Physical Training," The Macmillan Co., New York.

CRAWFORD, CAROLINE. "Folk Dances and Games," A. S. Barnes & Co., New York.

CURTIS, HENRY S. "Play and Recreation for the Open Country," Ginn & Co., Boston.

CURTIS, HENRY S. "Practical Conduct of Play," The Macmillan Co., New York.

CURTIS, HENRY S. "The Play Movement and Its Significance," The Macmillan Co., New York.

Department of Public Instruction, Indiana. Bulletin on Physical Education.

FISHER, IRVING, and FISK, EUGENE L. "How to Live," Funk & Wagnalls Co., New York.

HETHERINGTON, CLARK W. "School Program in Physical Education," World Book Co., Yonkers, N. Y.

HUTCHINSON, WOOD. "Exercise and Health," The Macmillan Co., New York.

"Manual of Activities and War Program for the Girls of America," Camp Fire Girls, Inc., New York.

"Manual of Customs and Drills for the Boy Scouts of America," New York.

MCKENZIE, ROBERT T. "Exercise in Education and Medicine," W. B. Saunders Co., Philadelphia.

New Jersey State Manual on Physical Training.

NEWTON, MARION B. "Graded Games and Rhythmic Exercises for Primary Schools," A. S. Barnes & Co., New York.

PYLE, WALTER L. "Manual of Personal Hygiene," W. B. Saunders Co., Philadelphia.

RATH, "Apparatus, Track, and Field Work for Girls and Women," E. Rath, Indianapolis, Ind.

RATH, "Folk and School Dances," E. Rath, Indianapolis, Ind.

RATH, EMIL. "Gymnastic Dancing for Girls' and Women's Classes," E. Rath, Indianapolis, Ind.

REILLY, FREDERICK J. "New Rational Athletics for Boys and Girls," D. C. Heath & Co., New York.

RAPEER, LOUIS W. "Educational Hygiene," Charles Scribner's Sons, New York.

STECHER, WILLIAM A. "Guide to Track and Field Work Contests and Kindred Activities," John Jos. McVey, Philadelphia.

STECHER, WILLIAM A. "Theory and Practice of Educational Gymnastic for Boys' and Girls' High Schools," John Jos. McVey, Philadelphia.

WILLIAMS, J. F. "Organization and Administration of Physical Education," The Macmillan Co., New York.

CHAPTER XX

VOCATIONAL GUIDANCE IN THE HIGH SCHOOL

The high school period the time for vocational decisions—A vital function of secondary education is the guidance of the pupil in choosing his life-work. The adolescent period is pre-eminently the time of vocational decision. The records in college and university offices indicate that in many institutions as high as eighty-five per cent of the students had made their choice of vocation before registration. To be sure, many of these choices were changed subsequently, and properly so, yet the experience of college administrators goes to show that the high school period is the time when the individual is ripe for consideration of this most vital question.

Evidence from ministerial candidates—An interesting bit of evidence of the truth of the last statement is produced incidentally in some recent surveys to determine the reason for the diminishing number of candidates for the Gospel ministry in the Protestant communions. It is found that the downward curve in the number of candidates corresponds exactly with the downward curve in the number of secondary students receiving their preparation for college entrance in church colleges, or in private classes conducted by ministers. In these church-controlled schools, the claims of the ministry as a vocation are brought per-

sistently to the attention of the student during his early adolescent period when he is ripe for suggestion. The result is a high percentage of choices of the ministry in proportion to the number of students reached. Prior to the last quarter of a century a majority of secondary students were in these sectarian schools, but during the last twenty-five years this class of schools has almost disappeared. In the secular schools the claims of the ministry have not been presented, with the result that most students have made their vocational choices before the sacred calling was brought to their consideration. It is the judgment of those conversant with the facts in the educational and church situations, and who know boy nature, that the explanation of the diminishing ministerial supply is not due to the unattractiveness of the ministry to modern youth so much as to the accident of presenting the matter to the young men after the best of them have made their decisions. It is a matter of sowing the seed after the proper season has passed.

This function of the school of utmost social importance—No one will question the vital significance of right vocational choice, nor will any one deny that the many and difficult factors to be considered by the boy in coming to his decision on any proposed vocation constitute a complicated and difficult problem, a problem which is beyond the unaided powers of the high school boy. This means that the high school has the direction of the youth during the period when he must consider a problem most vital to his own personal happiness and welfare, and to that of his future family, and of society in general; and that the nature of the

problem requires that the youth shall have painstaking and intelligent assistance. The boy needs the help of the school, and society needs that he be helped by the school. Possibly no other single thing has greater social consequence than the making of the right choice of a career. Primitive peoples recognize this fact in elaborate initiatory rites to celebrate the passing of the youth from childhood to the responsibilities of adult life. Thus, from both standpoints, that of the individual, and that of society at large, this function imposes upon the school a great responsibility and confers upon it a great privilege. No body of knowledge which the school can impart, no training it can give in liberal and mechanical arts, is so important to the individual and to the state, as guidance of the boy through the period of his rebirth. The most definite provision made by the school should be that for meeting this responsibility. The wisest and strongest teacher available should be procured for this service.

Principles to be observed by the teacher—The teacher should be governed by certain principles. The first is that the early adolescent years are the period of vocational consideration rather than of vocational choices. It is a mistake to push the student to a decision except under conditions which appear in a subsequent paragraph. An intelligent conclusion cannot be formed with reference to certain callings, until the individual has reached greater maturity and has had opportunity to try himself out through the scope and variety of advanced study. He must have time to make sure of his special abilities and to know

the nature of the calling. Many decisions ought not to be made until near the end or at the close of the college course. The boy should not be pushed to a hurried decision. The first principle is that the objective of vocational guidance in the high school is, primarily, to direct the student to an honest and intelligent consideration of the several callings open to him, getting the advantages and disadvantages of each before him, and also an adequate conception of the natural qualifications, and the kind and amount of training necessary to success in each calling. It is not the proper object of the high school in every case to cause the pupil to come to a decision prior to finishing the high school course.

The second principle is that society needs that the high school shall undertake the very delicate but exceedingly important function of the selective agency which shall sift out the individual pupils according to native ability and direct them at once into the channels which lead to the life-work for which they are natively fitted. The high school boy whose native abilities best fit him for electrical construction work should be brought to choose that vocation at once, and not be allowed to drive along into a profession in which he cannot succeed. Society, like a great army, is in need of all the "born" electrical construction men available, and can ill afford to have any good workmen spoiled in order to produce a third-rate doctor or shyster lawyer, who are not needed. On the other hand, society sorely needs doctors and teachers and preachers, and cannot afford to have any good material for these and other professions side-

tracked in any other kind of work. This selective function of the school imposes a very grave responsibility.

A third principle requires that the individual shall be permitted and encouraged to make his own choice of a vocation, just as later he should choose his own wife. The school should present all callings fairly, with no effort to "propagandize" in behalf of any particular calling. The teacher should avoid the effort, and the temptation, to enforce his own opinions on the pupil. His duty is to get the facts before the pupil with proper discrimination of the factors to be considered, leaving the pupil to form his own conclusions.

The vocation of home-making—In presenting the claims of the several vocations there is one of such general importance, both social and personal, that it deserves very earnest and intelligent consideration, the vocation of marriage and home-making. The great majority of the pupils in the high school will be married within a few years after the completion of the course. Marriage calls for all of the intelligence and special knowledge which the individual may acquire. The home and the church are so negligent or incapable of wise guidance in this important step that the school should come to the rescue. That there is need of training all thoughtful people recognize; that there is need prior to marriage of the proper conception of the duties, responsibilities of and qualifications for marriage and home-making, the records of the civil courts clearly attest. Since all but a negligible few will eventually become husbands and wives, and fa-

thers and mothers, what greater social service could the school perform than to provide such instruction as would enable the individual to enter upon the duties of the primary social institution with intelligent conceptions and a sensible attitude? Certainly the high school is in a position to render this service. It should do so in connection with its general program of vocational guidance.

Suggestions for study of the most prominent vocations—In the following pages are offered in the form of loose outlines, some suggestions for discussion of the several more important callings. These outlines are not presented as exhaustive, but are meant to be merely suggestive of the lines of thought which will serve to get the case of each calling before the mind of the pupil. They are taken from a presentation made several times before college freshmen, where they were found to be stimulating and helpful in organizing the students' thinking. The topics for discussion are thrown into the form of arguments for and against the vocation. In many instances, of course, the objection cited is not really an objection, but a danger to be expected and avoided. The teacher is supposed to amplify the outlines as time and resources permit.

These studies may take the form of assembly-room talks with the entire school, but better results will be secured if they are organized into a course to run in daily or at least twice-a-week lessons with smaller groups. The presentation should consist of talks by the teacher, questions submitted for discussion, library assignments and reports. Advantage should be taken

also of opportunities for "heart-to-heart talks" with individuals and small groups.

The Profession of Medicine

I. Attractive features of the Medical Profession.
   1. Offers large pecuniary rewards to the capable physician and surgeon.
   2. Medicine has no "blind alleys"; there is opportunity for continuous advancement in professional ability, recognition, and remuneration.
   3. Medicine offers a matchless opportunity for service.
      (a) Personal—Restoring health to the individual. Stimulating spiritual health, or healthy-mindedness.
      Reëstablishing him and his dependents economically and socially.
      (b) Social—Promoting public sanitation. Creating public intelligence with reference to health matters.
      Promoting moral conditions of health and right living generally.
   4. The heroism of the medical profession; the unselfish subordination of personal interest to the welfare of others; disregard of life in epidemics and great disasters; a warrior against the insidious enemies of human life, mindful only of saving the life that is threatened.

II. Objection offered to the Medical Profession.
  1. The large element of quackery alleged.
    (a) Leading patients on for big fees.
    (b) Concealment of ignorance (bluffing the patient).
  2. The temptation of weak men to immorality.
    (a) Personal.
    (b) Conniving at immorality in others.
  3. Heavy tax on physical strength, and loss of personal freedom.
  4. The long and strenuous preparation required for admission to the profession.

III. Qualifications essential for success in medicine.
  1. Personal.
    (a) Physical.
      1. Good health, large power of endurance, steadiness of nervous organization.
      2. Irreproachable moral character, excellent habits, scrupulous cleanliness of person, and of thought and speech.
      3. Magnetic personality, radiating hope, inspiring, and with an active sense of humor.
      4. Refinement.
      5. Mental characteristics.
        (a) Quickness of perception, and care of detail.
        (b) Analytic-synthetic type of mind.
        (c) Quickness of wit—resourcefulness.
        (d) Perfect self-control.

2. Educational.
   (a) General.
      1. *For knowledge,* Biology, Physics and Chemistry, Psychology, History, Literature and the Social Sciences.
      2. *For Discipline,* Mathematics, Classical Languages, and Logic.
   (b) Special—The studies prescribed in the pre-medical and the medical courses, with all clinical experience available, and a year of hospital experience.

The Profession of Law

I. The Inducements Offered.
   1. Large remuneration possible.
   2. Continuous personal and professional growth, because
      (a) The changing social situation requires new applications of principles, new laws, change of emphasis, etc.
      (b) Practice of law involves contact with every type of activity, thus affording opportunity for personal acquaintance with all kinds of people, engaged in all kinds of enterprises.
      (c) Every case is new, requiring fresh thought and special preparation.
   3. Offers opportunity for large usefulness.
      (a) To the individual, in
         1. Protecting him in his just rights, and
         2. As confidential advisor.

(b) To society, in setting up and sustaining proper social standards.

II. The drawbacks of the Law.
1. The danger of bad personal reactions.
(a) The temptations to greed, personal immorality and crime.
(b) The temptation, under the lash of ambition for professional success, to substitute legal trickery for scholarly and high-minded practice.
(c) The tendency to cynicism.
(d) The danger of coarsening of personality.
(e) The danger of mental stagnation in the case of the lawyer of small practice, or of highly-specialized practice.
(f) The deflation of personality of the lawyer who becomes the mere tool of another man or of a corporation—a creature to do its "dirty work."
2. The temptation to misuse ability.
(a) Shielding the criminal from merited punishment.
(b) Obstructing justice to serve private interest.
3. The temptation to go over into professional politics.

III. Qualifications necessary to success in the law.
1. Natural.
(a) Physical.
1. Health, endurance, energy, capacity for work.

2. Commanding appearance.

(b) Mental.

1. Alertness.
2. A well-balanced mentality.
3. Individuality.
4. Sociability.

(c) The will to succeed.

2. Education for the law.

(a) General: Broad liberal arts education, with emphasis of the following *for knowledge;* History, the social sciences, literature, philosophy, psychology, and the natural sciences; and of the following *for discipline;* The classical languages, mathematics and logic.

(b) Special: The course of study prescribed in a high-grade three or four-year school of law, with, if possible, an apprenticeship following the law course with a strong practitioner.

The Profession of Teaching

I. The Inducements.

1. The opportunity for service of the most significant and enduring character; the teacher is the "nation builder"—"What the teacher puts into one generation becomes the state in the next."
2. Association with the best people.
3. The teacher deals with the unspoiled element

of humanity; his work is developing, formative—the work of the physician and lawyer is largely with the broken and spoiled.

4. The opportunity for growth in the natural reactions of the teaching process, and because of the broad, stimulating contacts offered in the profession.
5. Regularity of income.

II. The objections to the teaching profession.

1. Small pay and part-time employment.
2. Drudgery of school routine, with consequent danger of getting into "a rut."
3. Severe tax of physical strength. Teaching is hard work.
4. Deflation of personality suffered by the subordinate teacher in some over-mechanized school systems.
5. Danger of becoming pedantic as the result of dealing with less mature minds.
6. Alleged lack of proper social recognition.

III. Qualifications: (See the personal, academic and professional requirements for the life-certificate in Indiana and other states making similar requirements.)

The Christian Ministry as a Profession

I. The advantages of the ministry as a calling.

1. The minister is the purveyor of the Law of Life to the individual and to society; he is the agent of salvation.
2. He is the ultimate history-maker, for he

(a) Gives to society the sanctions of public and private morality,
(b) The principles of organized society,
(c) The motivation which leads to constant progress in civilization, and the permanence of our institutions,
(d) Morale.

3. The minister enjoys the highest social recognition.
4. His life is protected from the rougher contacts of life.
5. He is the recipient of many material favors which go far to compensate for the meagerness of his salary.
6. The joys which he experiences in his victories are the keenest satisfactions possible for a man.
7. His contacts are the most stimulating.
8. The heroism of the ministry.

II. The drawbacks to the ministry as a calling.

1. The meagerness of remuneration, denying to him and his family the luxuries and many of the comforts enjoyed by others of their social group, together with the lack of opportunity for making money along collateral lines.
2. The fruits of the ministry are necessarily of an intangible character. It is difficult for a minister to know when he has won victories; discouragement attends this uncertainty. He misses the stimulation of perceived successes.
3. The danger of becoming so absorbed in the mass of routine of his "unfinished task" that

the priestly functions come to predominate and drown his prophetic zeal.

4. The tax on one's physical strength in being the source of inspiration for the group.
5. The danger of becoming narrow-minded and dogmatic.
6. The disadvantage of working for results which are not zealously desired by his "clients."

III. The qualifications requisite for success in the ministry.

(a) Personal.

1. Good health and physical development, with energy, large capacity for work, good physical presence, good voice.
2. Magnetic personality, radiating cheer, inviting confidence; sociability, adaptability, humor.
3. A consuming love of God and of all kinds of people; with an active desire to help.
4. Strong, well-balanced mentality; alert, resourceful, vigorous.
5. An irreproachable moral character.
6. An irresistible "call" to preach in the form of the deep-seated and permanent feeling that this is his "job" and that he can not be happy otherwise.

(b) The minister's education.

1. General.

In view of the fact that the minister is appointed to take leadership of all kinds and classes of people, engaged in all

kinds of activity, and concerned with all varieties of human interest, it is desirable that he possess the broadest and most liberalized academic training. The profession of the ministry makes larger demands upon general scholarship than any other profession.

It is evident that history, philosophy, sociology, psychology, and the natural sciences should be major subjects in his course.

It is also advisable for him to make an extensive study of literature and the classics for language-power.

2. Special.

The minister should be thoroughly grounded in theology, the Bible, church history, ethics and the technique of the ministry, as provided in a systematic training of three or four years of seminary study.

Journalism as a Profession

I. The inducements.
   1. Newspaper work fascinating to the man of literary impulse, of a lively curiosity as to affairs, and with an interest in public business.
   2. The journalist molds public opinion and therefore is the immediate maker of history.
   3. The broad and varied contacts with all kinds

of people; the chance for "inside" touch with people and affairs.

4. Opens up avenues of approach to other activities.

II. The disadvantages.

1. Poor compensation.
2. Temptation to prostitute one's powers through the press for
   (a) Personal profit.
   (b) For power. Danger of becoming the tool of organized interests.
3. The tendency to fall into a cynical attitude toward persons, parties, institutions and causes.
4. A tendency to bohemianism.
5. The mental stagnation in small-paper jobs.

III. Qualifications.

1. Abundant supply of energy; power of sustained application.
2. Alertness of mind; resourcefulness, versatility.
3. Sociability.
4. Dependability.
5. Self-control.
6. Accurate information about all kinds of things; an encyclopedic type of education, with special training in English. The newspaper man must be able to write.

Business as a Career

I. The inducements.

1. The chance to accumulate wealth.

2. If the individual owns his own business he enjoys an independent life.
3. Offers many and varied contacts with possibility of continuous growth in ability.
4. Romantic; business is full of chances.
5. Business offers opportunity for great social service through the promotion of industry.
6. Also, through support of all social agencies.

II. The drawbacks to a business career.
1. Uncertainty of profitable returns.
2. Danger of deflated personality.
3. Temptations to dishonesty and injustice.
4. Danger of arrogance.
5. Danger of becoming inflamed with greed for riches, and greed for power.
6. Danger of becoming narrowed to one viewpoint in life.

III. Qualifications for success in business.
1. No general scholarship required, but individual must master his "line," and must have general information as to industrial conditions.
2. Must have good working knowledge of human nature, including mental processes of the average man.
3. Mental traits.
   (a) Shrewdness.
   (b) Fearlessness.
   (c) Spirit of adventure.
   (d) Foresight.
   (e) Organizing ability.

(f) Sociability.
(g) Love of contest.

Farming as a Calling.

I. Inducements.
1. Certainty of equitable returns on investment.
2. Stability of investment.
3. Economically independent.
4. Offers the joy of creative activity.
5. The farmer sees immediate returns from his effort.
6. Socially useful, feeding, clothing and repopulating the country.
7. Offers opportunity for intellectual life.
8. The farmer easily may have all material comforts.
9. May have the happiest social relationships.
10. His family protected from the harmful influences of city life.

II. Drawbacks in farming.
1. The inescapable drudgery.
2. The farmer's work, like house-keeping, an unfinished task.
3. A seasonal occupation, the work piling up at certain periods.
4. The farmer does not fix prices; therefore, not the master of conditions as a business man may be.
5. The tendency of the farmer to become over-individualized and faultfinding.

6. The danger of narrowness and shortsightedness of view.

III. Qualifications for success.
   1. Personal.
      1. Physical endurance.
      2. Industry.
      3. Foresight.
      4. Optimism.
      5. Mechanical ability.
      6. Love of outdoor life, and of growing things.
   2. Education.
      1. The largest possible general education in history, the social sciences, biology, physics, chemistry, astronomy, geology, art, and literature. The farmer, above all other men, needs for his fullest life and enjoyment, and for his technical success, a broad liberal education, the prevailing opinion to the contrary notwithstanding.
      2. Special education in soils and soil culture, animal and plant husbandry, marketing, accounting, farm finance, insurance, etc.

Clerical Occupations
(*Bookkeepers, Stenographers, Bank Clerks, etc.*)

I. Inducements.
   1. Require small preparation in the way of scholarship, and but brief period of technical training. Small investment.

2. Require only moderate mental ability.
3. Chance for immediate employment with quick returns.
4. Certainty of compensation.

II. Drawbacks.
1. Small pay, and consequently limited living.
2. The "blind alley" job.
3. Detrimental to physical health.
4. Deflation of personality.

III. Qualifications.
1. Spirit of subordination to others.
2. A certain mechanical facility.
3. Formal memory.
4. Industry.
5. The technical training necessary to the employment.

The Trades

I. Inducements.
1. Do not require large mental ability, nor general scholarship.
2. Good moderate compensation, with immediate and rather fixed income.
3. Fixed, moderate hours.
4. Fair protection from injuries incidental to employment.
5. The satisfaction of creative and constructive activities.
6. Skilled labor makes for integrity, rugged honesty, directness, simplicity of life, and good judgment.

II. Drawbacks.
1. Seasonal employment.
2. Affluence not possible.
3. Danger of displacement of trade by introduction of new machinery.
4. The skilled worker among the first victims of industrial disturbance.
5. At a disadvantage in fixing prices of necessities of life.
6. May suffer some loss of initiative through working under a foreman.

III. Qualifications for success in trades.
1. Physical health and manual dexterity.
2. The mechanical "turn of mind."
3. Accuracy of observation and good judgment.
4. Industry.
5. Pleasure in "inside work."
6. Technical training for employment.

Public Service, and Governmental Employment

I. Inducements.
1. Attractiveness of living at the center of political activity and governmental control.
2. Broad and stimulating contacts.
3. Cosmopolitan connections and activities.
4. Travel.
5. The opportunity to render distinguished service in behalf of one's country.

II. Drawbacks.
1. Poor compensation.
2. High expense of living.

3. Loss of stability, development of restlessness.
4. Loss of permanent social relationships with group.
5. Alienation from the people; growth of bureaucratic disposition.

III. Qualifications.
1. High degree of natural mental ability.
2. Shrewdness.
3. Tact.
4. Sociability.
5. Secretiveness.
6. Persistence.
7. Self-control.
8. Abundant information, both general and special.

Summary

Youth is the period of vocational choices. No body of knowledge which the school can impart, no training it can give in liberal and industrial arts, is so important to the individual and to the state, as guidance of the boy through the period of adolescence as relates to his studies, his personal problems and relationships, and particularly his vocation. The most definite provision made by the school should be that for meeting this responsibility. The wisest and strongest teacher available should be procured for this service.

The principles which govern the advisor are: (1) the early adolescent years are the period of vocational consideration rather than of final choices—the pupil

should not be hurried to a decision; (2) the school should hold itself responsible as the selective agency, directing the individual into channels leading to the type of life-work for which he is natively fitted; (3) the pupil should not be subjected to undue influence in any direction.

It is recommended that provision be made for the intelligent presentation of the principles which should be observed in marriage and home-making. The home and church are so negligent or incapable of wise guidance in this important step, that the school should come to the rescue of both the individual and society. Since all but the negligible few will, within a short time after completing their high school education, marry and become fathers and mothers, what better service can the school render than to provide such instruction as will enable the individual to enter upon the duties of home-life with intelligent conceptions and a worthy attitude?

References

BLOOMFIELD, MEYER. "The Vocational Guidance of Youth," Houghton Mifflin Co., Boston.

BLOOMFIELD, MEYER. "Youth, School, and Vocation," Houghton Mifflin Co., Boston.

BREWER, JOHN M. "The Vocational-Guidance Movement," The Macmillan Co., New York.

DEAN, ARTHUR D. "The Worker and the State," The Century Co., New York.

DICKSON, MRS. MARGUERITE S. "Vocational Guidance for Girls," Rand, McNally & Co., Chicago.

GILLETTE, JOHN M. "Vocational Education," American Book Co., New York.

LINK, HENRY C. "Employment Psychology," The Macmillan Co., New York.

PARSONS, FRANK. "Choosing a Vocation," Houghton Mifflin Co., Boston.

RICHARDS, CLAUD. "Man of Tomorrow," General Board of Young Men's Improvement Associations of the Church of Jesus Christ of Latter-Day Saints, Salt Lake City.

WHITEHEAD, HAROLD. "Your Job," Biddle Business Publications, Inc., New York.

CHAPTER XXI

MORAL AND RELIGIOUS EDUCATION IN THE HIGH SCHOOL

Personal character the directive force—McGuffey's old "Fifth Reader" contains a selection entitled, "Knowledge is power." This is a very true saying. Knowledge gives power, and technical training gives skill. Power and skill are valuable acquisitions under a certain condition; otherwise, they are harmful both to the possessor and to society. Knowledge and skill alone do not constitute social efficiency; they do not assure the personal happiness and welfare of the individual possessing them. Knowledge and skill are like a sharp instrument; like a surgeon's knife which may be used to save life or to commit murder. This is a fact which the discriminating educator must not overlook. Academic and technical training are not sufficient. To neglect the training of the directive factor in human life is fatal. To send the petty thief to a school of engineering will probably get rid of the petty thief, but unless he is made over in his heart, he is pretty sure to turn his newly acquired mechanical knowledge and skill to crime on a large scale. To commit the science and art of medicine to a man whose heart is filled with lust, is to turn loose a wolf to prey upon the innocents of our homes. To give great legal ability to a man without socialized con-

science, is to equip an enemy of the public welfare. A great American chemist won the gratitude of the American people by his lifelong battle for pure foods and unadulterated drugs. Opposed to him in this historic struggle were arrayed other great chemists, employing the same chemical facts and processes, the same science and art. The equipment on both sides was the same. The difference was in the motivation. He was motivated by a conscientious regard for human welfare; they were actuated by anti-social, therefore, immoral motives. The difference was in the opposing moral attitudes of the two parties. On the one side, eminent scholars of great skill were selling their ability to corporations which were striving for an unholy profit in the health of little children. On the other was this valiant champion of the people's welfare, employing the same chemistry to protect their health and to save the lives of their children.

The school's responsibility for moral and religious education—Academic and technical education go toward determining what the individual *can* do; moral and religious education determine what he *will* do. A wise king, long ago, learned of man that, "As he thinketh in his heart so is he." Personal character is the ultimate *directive force* in human life, and obviously a scheme of education which looks to making the individual truly efficient for himself, and for society, must provide for training in fundamental morality. In view of the fact that religion supplies both the *inspiration* and the *sanctions* of private and public morality, the school can not divest itself completely of all concern for the spiritual nurture of the youth

of the nation. Particularly is this true under changing social conditions. To be sure, this function is the primary business of the church and a sacred duty of the home, but the lamentable fact which the American people face to-day is the failure of both church and home to reach the majority of the youth of our land effectively. The report of the Interchurch Survey makes the astonishing revelation that two out of every three persons under the age of twenty-five years, belonging to the Protestant population of the United States, have had no systematic moral and religious training. That is, they are not being touched by the church. That the home has, to equal extent, repudiated its responsibility in the matter is sadly true. After calling attention to the conditions existing, the report asks, "How long can a nation endure, 69.3 per cent of whose children and youth are receiving no systematic instruction in the moral and religious sanctions upon which our democratic institutions rest? And this question becomes acute when we learn how few hours of instruction are available annually for those children who do enroll in religious schools. If 'spiritual illiteracy is the forerunner of moral bankruptcy and national decay,' what are the lessons of these statistics?"

Existing social conditions—The seriousness of the situation which confronts our people justifies another quotation at some length from the same source. It may be added that the same conclusion as to existing social conditions and the underlying causes has been reached by strictly lay agencies, trade journals, and the public press.

"The United States of America has been invaded by three enemy armies which threaten our national existence. First, there is within our borders an army of five and one-half million illiterates above nine years of age; second, there is an army of fifty million people above nine years of age who are not identified with any church—Jewish, Catholic, or Protestant; third, there is an army of twenty-seven million Protestant children and youth, under twenty-five years of age, who are not enrolled in any Sunday School or other institution of religious training.

"If these armies should form in double column, three feet apart, they would reach one and one-fifth times around the globe at the equator. If they should march in review before the President of the United States, moving double column at the rate of twenty-five miles a day, it would take the three armies three years and five months to pass the President.

"These three interlocking armies constitute a triple alliance which threatens the life of our democracy. Patriotism demands that every loyal American enlist for service and wage three campaigns—a campaign of Americanization, a campaign of adult evangelism, and a campaign for the spiritual culture of childhood."

The church, of course, should be aroused to its duty in this triple campaign, and the virility of the home, if possible, should be restored. With all that may be done, however, in these two directions there is large responsibility accruing to the public high school for

the reason that, more than any other American institution to-day, it is reaching the youth effectively. The marvelous growth of the high school as the distinctively American institution carries with it certain responsibilities which it dare not ignore. Because of its popularity with all classes of people it becomes charged with functions of institutions which it has to some extent displaced in public favor and influence.

Not un-American for the public school to teach religion—Nor should the high school longer seek to escape its proper concern for the spiritual welfare of its students on the threadbare excuse that a public institution must not engage in any religious exercise. It is not un-American for the President of the United States to take the oath of office on the Holy Bible, nor for the Congress, state legislatures, and political conventions to open their daily sessions with prayer. The American doctrine of "separation of church and state" means that it is repugnant to our political principles, on the one hand, to establish a state church, or for the government to intervene in the administration of church bodies, and, on the other, for our government or any part or institution of our government to come under the control of any religious organization. The principle does not mean that the American state shall not consciously rest itself in a definite religious faith. Every act of the American Government has implied that this is a confessedly Christian nation, albeit full religious liberty is granted the individual. It was by no means the thought of the founders of the commonwealth that education should be secularized; that the public school should be ag-

nostic. It was emphatically their purpose that no public school should be controlled by a religious body, and that no public monies should be devoted to the support of church schools. That is, the American principle of "the separation of church and state," as originally interpreted, means that the *administration* of the public schools shall be completely secularized, but that at the same time, public *education* shall be definitely religious. Article Three of the Ordinance of 1787 contains the following significant provision: "Religion, morality, and knowledge, being necessary to good government and the happiness of mankind, schools and the means of education shall be forever encouraged." The same thought is found in Washington's Farewell Address: "Of all the dispositions and habits which tend to political prosperity, religion and morality are indispensable supports. And let us with caution indulge the supposition that morality can be maintained without religion. Whatever may be conceded to the influence of refined education on minds of peculiar structure, reason and experience both forbid us to expect that national morality can prevail in exclusion of religious principles."

Educationally significant facts—The first proposition is that the school must in the very nature of social conditions, and because of the nature of educational functions, be concerned with the problem of character education. The second proposition is that this problem belongs especially to the high school. Some general reasons for this responsibility were stated, but the particular reason is to be found in the psychology of youth and of character building. The more im-

portant facts in the psychology of youth were outlined in an earlier chapter. But it will be worth while to refer to them again.

Personality grows—The first of these educationally significant facts is that youth is the period of the dawning of Individuality and Personality. By the former is meant those characteristics of thought, feeling and behavior which distinguish the individual from other individuals. By personality we mean the individual self as added to and modified by the abilities, tendencies and experiences which are distinctively human. Youth is the time when the individual comes into his full membership in the human family, and develops those powers, abilities, and characteristics which constitute manhood and also a particular manhood.

Individual relates himself to society—Second, the high school age is the period in which the individual endeavors consciously to relate himself to his social and natural environments. He made adjustments throughout his childhood, but the process was to him unconscious, nondeliberate, and impersonal. Now he takes the initiative in the adjustments, and demands that they shall be made so far as possible on his own terms. In view of the fact that all ethical problems arise out of social situations and involve questions of the rightness and wrongness of social adjustments, it is obvious that the period in which the individual is most active in the formation of his own adjustments is peculiarly the ripest period for introducing him in a systematic manner to the entire system of morality.

Desire for personal insight—Third, developing in

connection with the first and second facts, is the youth's desire for *personal* insight. In the earlier years he was *given* information on the authority of adults. He was told what to think. He accepted the opinion of others without question. It did not occur to him to ask for evidence. Now he wants to see and understand for himself. He wants to form his own conclusions from data personally acquired, or which satisfy his mind as trustworthy. This fact is of great significance in all teaching, but particularly so in ethical and religious instruction in which there is so much temptation to dogmatism on the part of religious leaders and teachers. The pupil should not be forced to acceptance of an idea on the *ipse dixit* of any one; he has the fundamental right to do his own thinking. This right is constitutional. The young man cannot help himself; his soul demands its freedom and will have it. It rebels against dictation.

Doubt—The fourth fact to receive earnest consideration in character education, because of its utmost significance, appears with the impulse of independent or personal thinking. It is the fact of intellectual doubt. This trait is often the cause of confusion, distress of mind, and frequently of gross injustice to young people. By many, doubt is thought to be essentially a state of unfaith. This conception is seriously wrong and does the youth a grave injustice. The fact is that the adolescent is constitutionally disposed to faith, not, as so generally supposed, to disbelief. He wants to believe, but he wants to come to this belief by use of his own judgment, and to base this judgment on a foundation of intelligible fact. He wants to believe,

but he also wants to know the reason for the belief if a reason is to be had. His doubt is purely a mental state of honest inquiry for the grounds of belief; a desire to understand. Doubt is not only natural to the adolescent, but is exceedingly desirable as a factor in developing his personality. It is to be encouraged and wisely directed rather than condemned and foolishly suppressed. To eliminate doubt and the experience of the resolution of doubt from the life of a boy is comparable to cutting off the tails of tadpoles in the effort to hurry growth into froghood. Intellectual doubt in the young is the index of a healthily active mind, and of itself gives no evidence of the state of the heart beyond manifesting its desire for personal apprehension of the truth. It often happens that the desire to believe is so strong in the doubter that he suffers miserably from the disturbance created in him by the efforts of his mind to understand for itself. The attitude of the adult toward the individual in this process of maturing should be obviously one of sympathy, patience, and suggestion, rather than one of faultfinding and repression.

Transition from external to subjective control—The fifth fact of educational importance is that youth is the time of transition from external to subjective control; from control by authority imposed upon the child by parents, teachers and the police, to control by the individual's own judgment based upon his personal observations and insights. This is not so much a new fact as a slightly different aspect of the general development of individuality and personality, but is in-

dicative of the method of approach which must be increasingly adopted as the individual grows older.

From rule to principle—Sixth, the high school age is also the period of transition from conduct by rule to conduct by principle. The child does not sense the principle underlying a type of conduct, but he does understand and readily conform to rules. His stage of development requires the prescription of "thou shalts" and "thou shalt nots." The adolescent rebels against specific regulations, but readily assents to principles as guides of conduct and willingly accepts their logical application to himself. He rejects the letter but holds to the spirit.

Hero worship—The seventh characteristic of youth is its tendency to form strong personal attachments for persons who are thought to embody the ideals to which the individual has committed himself. This hero or heroine may be either real or fictitious. Around this idealized person gather the dreams and visions of youthful aspiration. The hero becomes at once both model and sanction. This is a fact of utmost significance. Goethe has said "We are shaped and fashioned by what we love." The character set up in the boy's heart as his personal hero becomes the prince of his life, for the admiration with which he devotes himself to the hero passes over into love, and we truly are shaped and fashioned by the persons and the things we love. Nothing has more significance in character education than these personal attachments. A wise preacher once said, "Tell me who is your son's prince or princess and I will tell you the kind of man your son will become."

The social instinct—The eighth fact which should be emphasized in this connection is the appearance of the social instinct, or the "herd impulse." This is more commonly referred to as the "gang instinct." It is one of the curious paradoxes of life that during the period when the sense of individuality is growing most rapidly, when the boy is most sensitive with regard to the recognition which he should receive as a person, he is seeking to identify himself with a group whose guiding principles he is likely to accept for himself out of his sense of loyalty to the group, even when he does not personally approve of the conduct of the group. He must not be thought of as apart from this group. Usually he is a little better than the group, for group membership involves compromise of personal opinion and settlement upon a body of conviction a little less than any one individual holds for himself. The sense of group loyalty of course is exceedingly strong, as any teacher knows who has endeavored to detach a pupil from his crowd and secure independent action. It was observed above that the ethical question always arises in a social situation. It is also true that the ethical code is always largely, if not wholly, a social affair. The word "moral" comes from the Latin, meaning custom, or the practice of the group. It is human to accept the practice of the majority of one's group as morally binding, as right. A scheme of character education must take cognizance of this social character of the code, and provide for the reinforcement of individual judgment and will by the will of the group. With individuals of weaker personality it is ordinarily sufficient to attach

them definitely to a group of right-living people to make sure of their characters as adults.

Youth is romantic—One other fact deserves presentation, the fact that the "teen age" is the age of the "dreaming of dreams and seeing of visions." Youth is romantic. It is not satisfied to rest in the here and the now. It yearns to spread its wings and fly to the mountain tops. It hungers for the superior. It dreams of adventure in which great deeds are done, great successes achieved, and the little and mean are spurned. Youth prefers the romance of manly living to the tame and contemptible meanness of low living, if once it breathes the romance of clean living. The eagerness of an army of young men for action, with supreme indifference to the cost, is not because of the lure of battle but because they are young men, ready to stake their lives on a cause. It is the romance of war that makes a great fighting machine. Young men will fight as valiantly in civil life for liberty, justice, honor, manliness, if they are let to see the romance in personal devotion to such causes.

What is Character?

Next in order is the endeavor to set forth an analysis of the psychological nature of character which may be taken, together with the psychological characteristics of youth, as a basis for a scheme of instruction and discipline looking to the formation of the desired ethical life. In this analysis two propositions may be accepted:

1. Character is the sum total of tendencies to behavior in social situations.

2. Character is grounded in personality.

Native tendencies—The tendencies to behavior are of two kinds: those which are of an instinctive nature, and acquired tendencies. The Instinctive Tendencies comprise Good Impulses and Bad Impulses. Current ethical theory has adopted as the criterion of judgment the following standards: An Act, Thing or Person is *Good* in the degree to which it contributes to the fullness, variety and level (above the brute line) of the satisfaction of the seven human wants—the biological, economic, intellectual, political, social, play and religious. For a very readable discussion of this criterion the reader is referred to Coffin's "Socialized Conscience." For additional discussion of the classification and nature of the seven "human wants" a quite satisfactory presentation of the subject will be found in Small and Vincent's "Introduction to the Study of Society" and Edman's "Human Traits." It is pertinent in the present discussion to observe that this classification includes every impulse and activity in human history. These several wants constitute the mainspring of human life. They are the motive forces which push man on in his effort to improve his condition. They are the causes of civilization. Civilization may well be defined as the sum total of those agencies, devices, and processes by means of which man satisfies his wants. The degree of civilization attained is measured by the extent to which he has secured the three aspects of satisfaction; namely, full-

ness, variety and refinement (level with reference to the "brute line"). That is, civilization is measured by the adequacy, variety, and refinement of the satisfaction of the seven above-named wants of human life. Human progress may be defined in the same terms, and likewise human welfare. Evidently this, also, is what Jesus meant by the abundant life. The ethical criterion, then, is the degree to which the act, thing, or person contributes to the abundance of life—to the adequacy, variety, and refinement of family life, or the possession of the material necessities of life, of education, of justice, of companionship, of the pleasure life, and of spiritual relations. Those things are good which contribute to such abundance; those things are bad which subtract from such abundance. The good is constructive, contributory to human well-being. Bad impulses are those which if permitted to function will be subtractive, destructive of human well-being. Good impulses, obviously, should be nurtured, and the bad impulses should be inhibited. Common sense joins the best psychology in laying down this principle, notwithstanding the dictum of certain well-known philosophers.

Acquired tendencies—The Acquired Tendencies comprise (1) Concepts, (2) Attitudes, and (3) Habits in the fields of family, industrial, educational, political, social, play and religious activity. A primary law of psychology is that, "Each state of consciousness tends to manifest itself in the corresponding motor response." That is, an idea tends to initiate the corresponding action, and will do so if not inhibited by another state of consciousness. A concept of a type

of conduct, therefore, tends to beget such variety of conduct. Knowledge of good tends to produce good, and will do so unless the impulse is overcome or sidetracked by a competing impulse. Knowledge of evil has the same tendency. The application of this fact to the character of experience which should be permitted to young people, its application to the theory of sophisticating youth, is apparent. It is at least true that young people do not engage in evil of which they are ignorant. To be sure there is something to be said concerning the protection of youth against evil by instruction as to its consequences, but even this sort of knowledge of sin is poison in itself and must be accompanied by an antidote.

It is also a primary law that one is instinctively drawn to what one likes, to what pleases, and as instinctively repelled by what one does not like, by what displeases. This is fundamental in evaluating the influence of the individual's likes and dislikes upon the growth of his character. It largely determines associations and activities, and these, in turn, determine habits. Probably no other factor in character-making has greater potency in shaping a life, and, if so, the presentation of the good in a pleasurable form and of evil in its ugly form should constitute a large part of the teacher's program in character education.

Many have regarded character as synonymous with the system of habits which the individual has formed. As indicated above, this is not the whole truth, but it does constitute a part of character large enough that the nature of the habits built up day by day is of great consequence.

Current moral training too narrow—The point of emphasis is that these concepts, attitudes, and habits, which constitute the acquired tendencies to behavior, are not to be limited to such simple virtues as truth-telling, honesty, industry, but are to be extended to the whole range of life. The real failure of the ethical training of the present day is its narrowness. It is still confined to those activities which made up the simple life of our grandfathers, a simplicity which has been outgrown at every point. Seventy years ago there were but few forms of theft. Now there are many more, and more intangible. Then, theft consisted principally in taking articles of food and clothing. Now it consists in taking all of these and, in addition, railroads, coal mines, banks, trust companies, factories, ungrown crops, and other articles which were unthought of not many years ago. Ethical education, to be truly effective, must help the student to a true conception of the facts of life to-day, in all its complexity and all of its relationships. The new ethics demands a life of active performance rather than a life of negations. To be innocent of profanity, lying, and other personal vices is good, but not good enough. A man might be that good, and yet not good for much. The new ethics requires that the individual shall be trained in his thinking, his attitudes, and his habits for the seven-sided life of to-day.

Character grounded in personality—The second thesis proposes that character is grounded in personality. Personality is partly native and partly acquired. By heredity man is (1) Historical, (2) Rational, and (3) endowed with certain Inherent Rights

and their corresponding Obligations. The characteristic of historicalness means that man is born with the ability to conceive and profit by his own experience and the experience of others reaching back to the beginning of human history, and that he may throw the light of this experience upon his personal problems or those of his contemporaries. Man is a rational being in the sense that he may organize his knowledge into a system of laws or principles which become working rules for his guidance in planning his activities. He may also, through the use of constructive imagination, project his life into the future, even to the end of time. Obviously, his personality will be proportionate to the degree to which he utilizes his historical ability and is truly rational. One man may utilize practically nothing of his own experience or that of others. A second man may utilize his own but no more; a third may bring to his service the experience of the community, while others will utilize more and more, until now and then will be found individuals who command the service of the entire known past. Clearly the latter are far larger persons than those who utilize less of their opportunity. Similarly, men vary in the extent to which they elaborate a system of governing principles, and also to the extent they live into the future. One may readily conceive a series of men, the first of whom lives from day to day with no working program beyond the satisfaction of his daily needs, the tramp. The second plans his life a few weeks ahead, the third a few years, the fourth his lifetime, the fifth has a working program which embraces the concerns of his great grandchildren, the sixth has working plans

which reach into the next century. The first is a tramp, the last is a statesman. The figure can be changed slightly to include the man who has planned his life not only throughout his earthly career, but through all time. Human personality varies with historicalness and rationality.

Sense of rights and obligations—We Americans believe that the individual is born with certain inalienable rights which he instinctively asserts, regardless of the accidents of birth and circumstance. If we face the facts of life, we recognize also that for each of these inalienable rights there is an inescapable obligation. For each thing due us, there is a debt to be paid. We also recognize that the individual may secure his rights only as his obligations are met by himself or by others for him, and that he may meet his obligations to the extent only that he is granted his natural rights. The degree of insistence upon these rights and obligations varies with individuals, and manifestly again, personality varies with the strength of the man's consciousness of his rights and obligations, and his fidelity in securing the former and observing the latter.

Elements of personality—Personality has its native and its acquired aspects. On the acquired side, personality is the result of the life which the individual is living. Life has been called a fabric, which is qualitatively and quantitatively determined. Qualitatively it is determined by its warp and woof. The warp consists of the objectives for which the individual is living, and the principle which he has selected to guide him in his ethical judgments. The woof is the experi-

ences which linger in his memory, both his personal experiences and those of others which have been communicated to him so effectively as to seem to be his own. Among these acquired experiences are the content of the literature which he has read. Quantitatively the fabric of life is determined by the individual's physical vigor, the strength of his tendencies to action, and the promptness of his reactions. These quantitative determinants are largely physical, although all are to considerable extent subject to training. Physical education has a large place in character-building, as has been well demonstrated in military schools. Increase of physical vigor adds to the force of character; increased strength of impulse, whether secured through psychological stimulation or through the radiation of good health; and the habit of promptness of reaction to command or inner suggestion—all these contribute to strength of character.

Moral control—An analysis of moral control by periods of development reveals the following synthesis of facts:

1. In childhood, the control is objectively imposed by: (1) Personal Authority of (a) parents, (b) teachers, and (c) the state; (2) by the Coercion of Group Opinion; and (3) Suggestion and Imitation. The control in childhood consists of (1) Concepts of proper behavior, (2) Sentiments with regard to different types of behavior, developed through fixation of admiration; (3) Habits, fixed by home and school discipline.

2. In adult life, conduct is subjectively controlled by: (1) Concepts of behavior which have been par-

tially thought out personally, partly accepted from the group, and partly inherited from childhood. Adult behavior is controlled in the second place (2) by attitudes which have in part grown out of personal experience, and in part have been absorbed from group affiliations. (3) The third control is the set of habits which the individual has formed.

3. Youth is a period of transition from the controls of childhood to the controls of manhood, and is governed in part by each type of control, the degree varying with the age of the pupil.

The foregoing may be shown by the following outline:

I. Character: the sum total of
Tendencies to behavior.
1. Instinctive.
(1) Good impulses—to be nurtured.
(2) Bad impulses—to be inhibited.
2. Acquired.

(1) Concepts
(2) Attitudes
(3) Habits
} In the fields of { Domestic, Industrial, Political, Educational, Social, Play, Religious } Activity.

II. Character is grounded in Personality.
1. Inherited elements.
(1) Historicalness.
(2) Rationality.
(3) Inherent rights and obligations.

2. Life a Fabric.
   (1) Qualitatively determined by
      (a) The Warp: The objectives and guiding principles.
      (b) The Woof: Personal experiences.
         Acquired experiences;
            From friends.
            From reading.
   (2) Quantitatively determined by
      (a) Physical vigor.
      (b) Strength of tendencies.
      (c) Habit of prompt reaction.

III. Moral Controls.
   1. In Childhood: Objectively imposed by
      Personal authority of
         Parents.
         Teachers.
         The State.

      This control comprises:
         Concepts of behavior.
         Sentiments developed through fixation of admiration.
         Habits fixed by home and school discipline.

   2. In Manhood, conduct is subjectively determined by Concepts of Behavior;
      Partly thought out personally.
      Partly accepted from the group.
      Partly inherited from childhood.

Attitudes, determined by
Personal experiences.
Group affiliations.
Habits.

3. Youth—a period of *transition* from the objective controls of childhood to the subjective controls of manhood.

A Suggested Program of Character Education in the High School.

1. Systematic physical training having as its objectives the development of good health, of proper sitting and standing posture, good carriage in walking, and skill in those aquatic, athletic and gymnastic sports requiring prompt attack, a high degree of co-ordination of mind and body, teamwork, courage, sustained effort, and fair play. Athletics conducted strictly in a sportsman-like manner have exceedingly high value in the development of personality. The reader will please recall the suggestions as to character values in the numerous references in this volume to supervised student activities. A philosopher once said that if he were permitted to write the music of a people he would not care who wrote their laws; it might with even greater propriety be said that if one could control the play of youth he need not care who wrote their music or their laws.

2. A vigorous, rich school experience in which the pupil is stimulated to a splendid citizenship in his routine relationships and activities. The initiative called forth in class discussion, the recognition of

personality in the give and take of the classroom, the dignified and thoughtful handling of situations in the daily routine which involve ethical problems, the enthusiasm of the student body, "school spirit," all are powerful factors in the making of character and afford the best of situations in which a wise teacher may make never-to-be-forgotten impressions of manliness. It is in no carping spirit that the statement is made that one serious weakness of much high school education is the prevailing "smallness" of it. The intercourse of teacher and pupil is on the low level of the drill sergeant and raw recruit. The atmosphere is one of small faultfinding, fussiness. Too rarely do the teacher and his students get on a high-minded "man to man" level of intercourse. In this part of the program, also, it is recommended that the high school make much of "student activities" as a means of character building. At the best, the classroom relation involves the subordination of the student to the teacher. Real democracy in the recitation is a dream which is not often realized. Dramatics, the orchestra, the literary club, the debating society, and similar organizations afford splendid facilities for exercise of student initiative and responsibility. These activities are not merely "safety valves" for using up surplus energy and thereby preventing disorderly outbreaks. They are legitimate functions of the school, and should be as carefully planned and vigorously conducted as are other activities.

3. A course of instruction, comprising daily lessons throughout a semester, in addition to "morning exercise" talks and special lectures, in which the objective

is the development of concepts of the fundamental principles which should govern behavior. These principles should relate to manners as well as morals. This course should not be a study of formal ethics. Rather, it should comprise an examination of the functions of the several social institutions, their necessity to the existence of human life, the nature of civilization, and of the factors which contribute to its growth, the results which would ensue if any of these factors were destroyed or its efficiency reduced. Such a course would undertake to portray the service which bank, railroad, church, school, government, the park system, capital, labor, producer, consumer, render to society, the degree of necessity of each to the others and to the community as a whole. It would be a course primarily in social values and relationships which would give the pupil data for arriving at his personal convictions. The course may be described as a study of social ethics. The proper text for such a course has not yet been published. The nearest in substance and spirit is Coffin's "Socialized Conscience."

4. Cultivation of right feelings and attitudes by attaching the pupil through stimulating his admiration to wholesome personalities in the community; in the state; in the nation; in history; in literature; in the Bible. The potency of hero worship we all recognize. The hero is created for the individual pupil by fixing his admiration upon a man or woman of outstanding character. In any community there are men and women who are eminently worthy of admiration and imitation, just as there are in state and nation.

We have found and utilized the value in attaching the youth of our land to Washington, Lincoln, Grant, McKinley and Roosevelt. This is precisely the thing here recommended; with this addition, that in the community of which the school is a part are men and women of as lofty character, as fine citizenship, and as great usefulness in their respective capacities as are our national heroes, and it is essential to a truly moral chacter that one possess the ability to recognize true worth in lowly situations as well as in exalted positions. There is no sufficient reason why a prophet should not receive due honor in Nazareth. The content of history and literature lends itself particularly to this phase of moral education. Much may and should be made of biography, and because of its special value in character-development, biography should be taught for appreciation. It is unnecessary to say that the one great source of spiritual nurture is the Bible, the source of the intellectual vigor and moral strength of the Lincolns and Roosevelts who in no small sense have been successors in the prophetic line, and that the one personality in all human history truly most admirable and worthy of imitation is the central figure in the scriptures. The only infallible rule for character-development is in the commandment to love God with all of one's being and the neighbor as one's self, remembering that God is known through Jesus Christ and that in loving the neighbor we have learned to love and serve the Christ.

The second means of cultivating right feelings and attitudes is through control of the pupil's social situations in school and out of school. The youth as well

as the child is peculiarly susceptible to the suggestions emanating from his associations. The kind of people who constitute his intimates will more or less permeate his mind and heart with their feelings, biases, and evaluations. There is a certain element of the chameleon in human nature which makes it readily take on the color of its environment. This is also true of the physical as well as the personal associations. The educative significance, in relation to the nurture of the affections, of street signs, advertising boards, and property conditions, is extremely large. Besides, there is a system of pleasure life in most communities, of questionable character, which requires regulation by educational authorities, either those of the school or of the community at large. This function is performed to some extent by the Young Men's Christian Association, by the Scout organization, by church societies, and similar agencies. But everywhere there is a large population of young high school boys and girls, unprotected and undirected in the great "school-out-of-school," who sorely need such protection and direction of their social relations and activities.

5. The developing of right habits through a wise, steady, vigorous school discipline in connection with a proper home discipline, to be secured in part at least through the medium of parent-teachers associations, and also by sensible regulation of student activities.

Four things the high school may do in religious education—In the matter of religious education there are at least four things which the high school may do without trespassing or exceeding its proper and legal functions. First of all, the school administration may de-

cline to employ any teacher who is not loyal to the faith which furnishes the sanctions upon which the liberties and the rights of the American people rest. The state may require that the men and women who go before the youth of the community as representative of those things which make for manhood, shall be right at heart as well as in their academic attainments. The second thing which the high school may do is to give God his rightful recognition in the background of instruction. It is worth much if a place can be found in the daily program for a period of devotional service, but this is not so important as that the "logical universe" within which instruction is organized shall be definitely pro-God. The fear of the Lord has always been the beginning of real wisdom, and is so in high school education as elsewhere. In many states, what is known as the North Dakota plan of Bible study has been adopted with quite satisfactory results. Obviously, and wholly aside from its value in the nurture of the spiritual life, a knowledge of the Bible is necessary as a preparation for the learning of history and for literary interpretation, and the appreciation of art. It is also necessary to an intelligent grasp of the common law which lies at the basis of our political system. It would seem but a matter of sensible procedure to make the study of the English Bible a large factor in the educational scheme. In all that is said here it is understood that there is no place whatever in the public school for denominationalism, nor for the presentation of a system of theology. These belong to the church. However, religion and spiritual law belong to life, to the school as much as

to the church. The fourth thing which the high school may do is to give its endorsement to the church and to all religious agencies and activities, and encourage its students to full participation therein.

Summary

Personal character is the ultimate directive force in human life, and obviously a program of education which looks to making the individual truly efficient for himself, and for society, must provide for training in fundamental morality.

In view of the fact that religion supplies both the inspiration and sanctions of private and public morality, the school cannot divest itself completely of all concern for the spiritual nurture of the youth of the nation.

In view of the failure of the home and church to reach the majority of the population with any systematic instruction in the moral and religious sanctions upon which our democratic institutions rest, and the marvelous growth of the public high school as the most influential institution with all classes of people, the secondary program incurs the obligation to make suitable provision for securing the needed moral and spiritual training.

It is not un-American for the public school to teach religion. The principles of "separation of church and state" refer to control and financial support, and do not mean that the American state shall not consciously rest itself in a definite religious faith. It was not the thought of the founders of the nation and its pub-

lic schools that public education should be agnostic.

The problem of religious education belongs peculiarly to the high school period because of the nature of religion and the psychology of youth.

Character is the sum-total of tendencies to behavior in social situations. It is grounded in personality. Tendencies to behavior are (1) instinctive, comprising good and bad impulses, and (2) acquired. Those impulses are good that contribute to fullness, variety, and refinement in the satisfaction of the seven varieties of human wants; other impulses are bad. The acquired tendencies comprise: (1) concepts, (2) attitudes and (3) habits, in the fields of family, industrial, political, social, play and religious activity. Again, the nature of the contribution to the general welfare is the test of goodness.

Current moral training is too narrow for the reason that the complexity of the social situation has outgrown the categories of the old morality.

Personality has its native and acquired aspects. With respect to the acquired factors, personality is the result of the life the individual is living, and to this extent is subject to education.

The program of character-education may comprise the following elements: (1) systematic training for health and co-ordination of mind and body; (2) a vigorous and rich school experience stimulating the pupil to good citizenship in his routine relationships and activities; (3) a course of instruction in the fundamental principles of conduct; (4) stimulation of admiration for wholesome personalities in the community, the state, the nation, in history, in literature,

in the Bible; (5) inculcation of the love of God and the neighbor.

Four things the high school may do in religious education: (1) decline to employ any teacher who is not loyal to the faith which furnishes the sanctions upon which the liberties and the rights of the American people rest; (2) give God His rightful place in the background of instruction; (3) it can in most states provide instruction in the Bible; (4) it can give its endorsement to the church and to all religious agencies and activities, and encourage its students to full participation therein.

References

ADLER, FELIX. "The Moral Instruction of Children," D. Appleton & Co., New York.

BARCLAY, WADE C. "Principles of Religious Teaching," Methodist Book Concern, New York.

BRIGGS, LEBARON RUSSELL. "School, College, and Character," Houghton, Mifflin Co., Boston.

BODLEY, H. S. "Fourth R, the forgotten factor in Education," F. H. Revell & Co., Chicago.

BRYANT, MRS. SOPHIE W. "Moral and Religious Education," Longmans, Green & Co., New York.

COE, GEORGE A. "Education in Religion and Morals," Fleming H. Revell & Co., Chicago.

DEWEY, JOHN. "Moral Principles in Education," Houghton Mifflin Co., Boston.

FAIRCHILD, MILTON. "Character Education," Washington D. C.

FOSDICK, HARRY E., "Twelve Tests of Character," Doran, New York.

GRIGGS, EDWARD H. "Moral Education," B. W. Huebsch, New York.

HALL, GRANVILLE S. "Youth: Its Education, Regimen, and Hygiene," D. Appleton & Co., New York.

HALL, MRS. ALICE S. "Practical Science of Character Building," Stanton & Van Vliet Co., Chicago.

HART, JOSEPH K. "A Critical Study of Current Theories of Moral Education," University of Chicago Press.

HORNE, HERMAN H. "Idealism in Education," The Macmillan Co., New York.

LADD, GEORGE T. "The Philosophy of Conduct," Charles Scribner's Sons, New York.

LEE, HETTY. "Present-Day Problems in Religious Teaching, The Macmillan Co., New York.

MACEACHEN, RODERICK A. "Teaching of Religion," The Macmillan Co., New York.

NEUMANN, H. "Education for Moral Growth," D. Appleton and Company, New York.

PALMER, GEORGE H. "Ethical and Moral Instruction in Schools," Houghton Mifflin Co., Boston.

SADLER, MICHAEL E. "Moral Instruction and Training in Schools: Report on an International Inquiry, Longmans, Green & Co., New York.

SCHROEDER, HERRMANN H. "The Psychology of Conduct," Row, Peterson & Co., Chicago.

SETH, JAMES. "A Study of Ethical Principles," Charles Scribner's Sons, New York.

SISSON, EDWARD O. "The Essentials of Character," The Macmillan Co., New York.

SPILLMAN, BERNARD W. "Study in Religious Pedagogy," Fleming H. Revell & Co., Chicago.

STARBUCK, EDWIN D. "The Psychology of Religion," Charles Scribner's Sons, New York.

CHAPTER XXII

TRAINING THE HIGH SCHOOL PUPIL TO STUDY

Making the pupil a student—In general, there are two objects to be accomplished in the course of instruction: First is the immediate acquisition of Knowledge, Attitude and Skill or Habit, which have been kept in view throughout the volume as teaching objectives; the second object is the training of the student in the methods of acquiring information for himself. It is the purpose to make the pupil independent of the school and its ministrations as fully and as early as possible. The sooner he develops a definite aspiration in the direction of larger knowledge and ability, together with skill in finding his own way, the more effectively may the school perform its office. As between inspiration and information, the former is worth far more in the long run, and as between the immediate results of the school process and the development of ability in the pupil to work for himself without the aid of the teacher, the latter is much more valuable. The proper ambition of the teacher is to equip his pupils with definite aspirations for knowledge, and the ability to secure it for themselves. He realizes that at the most his course can but open up the subject in a very elementary way. He cannot present more than the fundamental facts and principles. His instruction will be far from securing the

mastery which the pupil needs. The educational process needs to go on indefinitely. In order that it may do so, and in the right direction, his ultimate concern is that the pupil develop such depth of interest that he will not rest satisfied with the small attainment of the classroom, and gain such habits of study that he may continue to work for himself effectively. It should be repeated that the larger service of the school is to train its pupils in methods of study which will make them independent of the teacher's help, and then give them an adequate motivation.

Principle of self-activity—The wise teacher keeps in mind the fact that intellectual growth, like physical growth, is secured by the self-activity of the individual. The corn plant must do its own growing; the farmer may manipulate the conditions of growth, prepare the soil, let in the sunlight, provide moisture, and remove the competition of other plants, but the plant itself must take up the food materials, perform the necessary chemical changes, distribute them to the various parts of the plant, put out its own foliage and send its roots down into the earth. It must be active. The teacher cannot eat his pupil's breakfast, digest and assimilate it for him. Nor should he "carry the ball" in the classroom. A college student once said of his mathematics teacher: "He knows the subject, and he knows how to explain its difficulties, but he carries the ball all the time himself and keeps us on the bleachers." This is a very good description of what goes on too generally in the classroom. The pupils are kept on the bleachers. Many teachers have a mistaken view of the relative importance of school exercises. They

suppose the daily recitation is the event of primary importance. The fact is that the study period is the vital exercise, for in it the pupil is most self-active. The business of the recitation period is to direct the activity of the study period; to motivate the pupil for it, to formulate the problem to be solved, to give necessary instruction as to mode of procedure and sources of material, and to check and supplement the pupil's results the following day. It will work a desirable revolution in school methods and results if teachers will organize their courses in such manner that the recitation will seek to promote the study exercise, rather than to make the study period a preparation for the recitation. Teachers should be judged by the work of their pupils in the study period, not by their own facility in the recitation. This suggestion is offered to supervisors as a plan for greatly improving teaching methods in their schools. The working principle is, *The object of the teaching process is to beget and direct the learning process; it is the latter which secures growth.*

The art of learning—There is an art of learning, and an art of teaching. The latter exists to secure the former, and its *processes* are determined by it. The real methods problem is how the pupil may learn his lesson, and what shall the teacher do to stimulate the pupil to go through the necessary process. Most normal schools are at fault in this particular. They train the prospective teacher to set her attention upon her own performance instead of the performance of the pupil. Educational science recognizes the primacy of the principle of self-activity, but the training

school does not consistently apply it in the preparation of teachers.

The art of study not native—The pupil must acquire the art of study. That is, he is not born with it. He comes into the world with a very active curiosity, insatiable, diffuse, indiscriminate as to values. He must learn to control his attention, and he must be subjected to a long and vigorous discipline in inductive and deductive processes, in methods of attack, of record. The teacher cannot expect her pupils to come to her equipped for the technical processes of formal study. Children are born with the machinery for study and with the disposition to study, just as a colt out of racing stock is born with the machinery and disposition for racing. However, the colt requires an infinite amount of training before he is ready for his first race.

Methods of study general and special—Methods of study are (1) general and (2) special. That is, there are certain conditions and processes which occur in all study exercises, and also there are certain processes necessary in each study and peculiar to it. The pupil sets about learning a lesson in geometry in some respects in the same way in which he learns a lesson in history; but there is, besides, a mode of attack and a thought-curve in geometry which do not occur in history. There is one way of learning a geometry lesson and another for learning the lesson in algebra, a general method for all mathematics and a special method for each mathematical study. The learning process in plane geometry is not entirely the same as that of solid geometry. The teacher must re-

member this fact in transferring her class from one subject to the other. She must introduce them to the new method as well as to the new subject matter. In passing from elementary Latin to Cæsar the pupils are confronted with a new learning process in which they must be instructed and trained if they are to succeed. A successful Latin teacher was in the habit of taking the first two or three weeks of the term to induct her class into "the art of reading Cæsar." She spent all of the allotted time during this period in studying with her pupils, showing them how she proceeded in the preparation of an assignment, how to use the vocabulary, the grammar, how to attack the sentence, where to take hold and how to make fast. She was an adept in the art of common sense. Her pupils were enthusiastic, always prepared, because they knew how to prepare her lessons, and their accomplishment in quality and quantity always exceeded the work done under other teachers. It should be said in passing that student ability for a particular study is largely a matter of knowing how to study the subject. A very good teacher of mathematics received a class which was ready to take up the study of simultaneous equations and which had been given a very high rating by their former teacher in the first part of the course. They were wholly disappointing to themselves and to the new teacher. After some three or four weeks of discouraging effort the teacher applied for advice. He was asked whether these pupils had been trained for the new phase of the subject. His idea was that they knew intuitively how to proceed, but he agreed to take ten periods in training them for getting the new les-

sons. At the end of the time he reported with great enthusiasm that his class was now doing well, the best class he had ever had. A second-year girl was reported as incapable of learning history, and the fact was brought out that she had required two years for each of the grades, being in each case promoted *ex gratia* in history. The teacher was asked whether the girl knew how to study a history lesson. Investigation disclosed that she was faithful in application, exceedingly conscientious about her work, and devoted sufficient time to accomplish her assignments. It was also disclosed that her teachers regarded her as dull in history while exhibiting fair ability in other studies. The girl also had been led to feel that she was mentally inferior. The teacher was asked to take her for his conference period for ten days and show her how he proceeded in attacking history lessons, and advised to go about it in the fashion of a good Samaritan. At the end of the period he reported that he was satisfied with her native ability and that he had discovered she had gone through these several years of history work without "getting the hang of history study." He gave her the "hang" of it and the young lady finished the course with the best half of the class. It is needless to remind the reader of the crime against children of charging up as a matter of the child's ineptitude, the teacher's failure to induct the pupil into the art of study. If the individual can count ten, conceive a bit of indicated space, understand a ratio, and wants to learn, he has all of the psychological equipment for the learning of mathematics—all that the greatest mathematician ever had. If he can give an accurate

account of the events of the morning in proper sequence, can keep his account true to the sequence of incidents, can draw proper inference from bits of evidence, he possesses all the mental machinery for the mastery of history. All that he needs in addition is adequate motive, apperceptive material, and the "hang" of the reading of history. These additional things that he needs are not hereditary; supplying them is the business of the teacher. Studies are tools the use of which the pupil must learn, and each tool has its own peculiar handling which requires special training.

The will to learn—It was suggested above that the purpose of the recitation with reference to a new lesson is two-fold: first, to motivate the pupil for the lesson; and second, to give him the needed directions as to procedure and sources of material. Let us again emphasize the importance of arousing in the pupil such desire for the new information or accomplishment that he will attack the assignment with vigor. Dr. Jordan used to say that "when a man makes up his mind where he wants to go he is half way there." Stimulating the pupil to want something with all his heart is more than half the battle. Once a boy wants to know geometry, as did Abraham Lincoln, he will get it without a teacher. After all most of the waste motion in school is due to the fact that the pupils have not been awakened to a working interest in the subject pursued. They have not been made to "want" the new thing. "Morale won the war." Morale in the sense of a real zeal for their studies will make students efficient. Usually the individual gets what he wants.

"Ask and ye shall receive; knock and it shall be opened unto you." This is the first principle also of student efficiency.

General survey and critical study—In general study, two processes are involved: first, a general survey of the lesson, noting its outstanding features and parts; second, critical study of each part and feature. In the chapter on teaching English classics these processes were illustrated. In the general survey of the assignment, the class was directed to read the selection through, get the story as a whole, master the vocabulary, the figurative expressions, getting the general acquaintance with the selection as a whole which must be in mind in order to take up the critical study of particular features and divisions in their proper relation to the whole. After this general study has been completed, the class then takes up such special features as plot, characters, style, diction, historical setting, likeness to other selections, the characteristics of the author, memory passages.

In learning the proof of the equality of two triangles the procedure would be the same. First, the pupil addresses himself to the proposition as a whole, getting the conditions set forth, the relation to be proved, and the relation of the new problem to his general field of knowledge. Second, he divides his problem into its constituent parts, thinks out each step in order, and then synthesizes the whole into a logical argument. If the lesson assignment is the Great War, the first step will be the general survey, getting in mind the time and place of the war, the causes in a general way, the participants, the more important campaigns, and

the final outcome. Having established such landmarks of thought the pupil is then to take, one after the other, special features of the war and think each in relation to the war as a whole. These special topics may comprise particular campaigns, the accumulation of causes differentiated as ethical, economic, religious, geographic, ethnic, leading personages, the financial aspect of the war, the aspect of army building, development of military equipment, and different branches of service, in detail.

The following scheme for the exhaustive study of a topic, large or small, is derived by application of the principles of logical relations, and with proper modification as to emphasis and sequence, is readily available in any high school subject. Every fact and relation which can be involved in a situation finds a place in this scheme.

Scheme for Study

I. Study all of the characteristics which may be apprehended through Sense Perception:
   1. Through Vision, as; Color, shape, size, distance, etc.
   2. Through Hearing; Sounds, noises, tones, etc.
   3. Through Smell; Odors.
   4. Through Taste; Flavors.
   5. Through Touch; Smoothness, roughness, temperature.
   6. Through Muscular Resistance; Weight, strength, hardness, softness, etc.

II. Relations:
1. Contiguity in time and place.
2. Similarity and contrast.
3. Whole and part.
4. Cause and effect relations.
5. The noetic relations.

The use of this scheme may be illustrated in the study of a tree, a maple for instance. The first division of the study will be directed to the characteristics of the maple observed through direct sense-perception. A typical tree should be taken. The pupils proceed to discover the shape and size of the adult tree, the color of foliage, of bark, of woody fiber. Second, they note odor of foliage, root, bark, wood; third, the flavors of the several parts; fourth, roughness of bark, texture of wood, the surface of the unpolished wood, of the polished wood, etc.; fifth, hardness of wood, tensile strength, weight, flexibility, etc. There will be no sound characters to consider. Second, the pupils investigate the relations of the tree to other trees, to its environment, and to the pupil. Under the first head, they will investigate the distribution of the maple, time of seeding, germination, growth, etc., the age of the maple. Under the second head, they will consider the likenesses and differences of the maple in comparison with other trees, determining its place in the plant system. The third relation involves the structure of the tree, its anatomy, as usually presented in the botany text. The fourth relation leads to the study of the growth of the tree from the seed, its food, its processes of nutrition, the various conditions affect-

ing its growth; and of the uses of the tree; economic, æsthetic, etc. The noetic relations will be confined to the individual pupils who may have had a peculiar experience involving the maple tree.

Modifying the scheme—Other illustrations have been given in preceding chapters. The sequence will vary with the nature of the topic, and the emphasis will depend upon the extent of former study, the relevancy of the particular topic to the lesson as a whole, the time available. Any scheme for study must be applied with common sense. The preceding aspects of any subject under study must be brought out in some order and in proper proportion. Otherwise, the teacher should employ the approach which "works" most readily for him. The important thing is that the teacher give the pupil a definite mode of attack, which will set him going, direct his progress systematically, and provide him with a means of determining for himself whether he has completed his study. Any scheme must possess these three characteristics; it must give initiative, direct the advance along progressive lines and afford a means of knowing when the task is completed.

The lesson assignment—The character of the lesson assignment is an important factor in directing the study process. The assignment may take different forms, depending upon the stage of study and the age of the pupils. It may be in the form of topics or themes set for study, of questions, the answer to which will require the pupil to go through the learning process desired, or it may be in the form of a certain quantity of text which the pupil must master. For

advanced students, and for those who are covering familiar ground and have acquired a method of study, the topical assignment will be satisfactory. If the pupil is in the fact-gathering stage of the lesson and the text contains the information which he needs to acquire, the text assignment is entirely proper. Ordinarily the question form of assignment is most effective with students of all ages and grades of advancement. This is for the reason that it contains within itself the necessary motivation, and states definitely the thing to be accomplished. A good lesson assignment should perform the following services: (1) state definitely the thing to be accomplished in a way which moves the pupil to make the effort of accomplishment; (2) indicate, if not already known, how the pupil should proceed to find the solution; and (3) cite the available resources for materials necessary in the solution. The thing to be accomplished is most effectively stated in the question form. There are two reasons. First, it avoids the appearance of command, which tends to stir up mental opposition. Second, as Judd points out in his "Psychology of High School Subjects," we study when we feel the need of adjustment to a situation. The mind goes out instinctively in search of adjustment. It strives to come to rest. The existence of an unanswered question, or of an unsolved problem, involves the absence of adjustment. The question form of assignment has the further value of being definite. The pupil may know what is wanted, and when he has satisfied the requirement. This form of assignment, therefore, meets the first and second conditions. In connection

with the question, or other statement of the accomplishment demanded, the assignment should make sure that the pupil takes up his work with a plan for its accomplishment. The extent to which directions for learning the lesson shall be included in the assignment will depend upon the advancement of the pupil and the phase of the lesson under study. The principle is that the pupil shall know definitely enough how to set about the study, to enable him to do what is expected of him. If, as sometimes happens, the teacher desires that he work out a method of attack for himself, the discovery or invention of such plan should constitute the goal of the assignment, and the content of the lesson will take a subordinate place, becoming material to be employed in elaborating the method. Lastly, the pupil should have sufficient direction as to sources of material when he begins his study, to enable him to proceed without waste of time and energy. This last condition may be met by giving the class special training in the use of reference books such as dictionaries, encyclopedias, atlases, source-books. This training will include the use of the card index, the book index, maps, charts, graphs, cross-references, book reviews, chapter and book summaries, and a knowledge of the contents of dictionaries and encyclopedias. A few days of intensive training in the use of such material will greatly increase the effectiveness of class work.

"Questioning the book"—If reading assignments are made, that is, sections of the text are assigned for study, the pupil may be trained with advantage to "question the book." He really questions himself

over the content of the assignment, taking the rôles of both teacher and pupil. Thus, if the assignment is a section of the geography text relating to Greenland, the pupil may be trained to begin by asking himself what the lesson for the day is about. This requires the reading of the lesson as a whole to answer. Having ascertained that much, he then asks himself "What different things does the book tell about Greenland?" He rereads and decides that the text tells about surface, climate, people, and their industries. He asks next, "What does the book tell us about the surface?" "What does it tell us about the climate?" So he proceeds to the end, finally organizing the lesson content by saying to himself, "The lesson tells about four things, surface, climate, etc. It tells three things about surface, namely, etc." This practice, which, by the way, is feasible in the intermediate and grammar grades as well as with more advanced students, has several advantages. First, it gives the pupil a definite mode of procedure. Second, it is effective in fixing the content in mind. Third, and of most importance, it puts the pupil in an active attitude toward the assignment. He works on the material of the assignment, as material; he attacks, aggressively and with a plan; he is not left to the dubious chance of "absorbing" the content by formless reading of it.

Supervised study—Since study of the lesson is the dynamic center of the instruction process, and the acquiring of proper habits of study the best value the individual receives, it is obvious that the study exercise demands the most careful attention of the teacher. Such attention is possible only under the plan, fortu-

nately becoming more general, of "supervised study." It is unnecessary to occupy time in this connection with a discussion of supervision of the study period. The chapter has been pointing to the conclusion that the daily schedule of exercises should be built around the study period as the activity of primary importance, the time, nature, and frequency of the recitation being determined by the needs arising in the study exercise. The recitation thus becomes a species of business meeting for conference as to progress in the real work of the class, which is being done individually in the study room, and for creating the social situation which will yield the necessary motivation. More and more, the school should take the form of a place where pupils study and experiment and debate, rather than a place where they go to recite lessons.

Summary

The real teacher strives to make his pupil independent. To accomplish this he aims to motivate the pupil with an impelling interest in the subject, and to train in the methods of attack peculiar to the subject. For this reason, he is vitally concerned with the problems of motivation and of training the pupil in the art of study.

He is the best teacher who succeeds in making himself unnecessary to the pupil, and the best school is that in which the pupil does the most for himself.

The real methods problem is how the pupil shall proceed to learn the lesson, and the stimulations thereto which the teacher may employ.

The art of study is not native; the pupil must acquire it.

Methods of study are (1) general and (2) special. There are certain conditions and processes which occur in all study exercises, and besides these there are certain processes peculiar to each study. This requires that each teacher shall hold himself responsible for training his pupils in his particular subject.

"Morale won the war." Morale in the sense of the "will to learn," a real zeal for studies, will make a student efficient.

In general study, two processes are involved: (1) a survey of the lesson as a whole; (2) critical study of each part and feature. These processes are illustrated in the plan for the study of English classics given in Chapter V. The same plan is embodied in the scheme for study included in the present chapter.

The lesson assignment should contain directions for study in the case of immature pupils. The form the assignment takes will depend upon the stage of their progress in the subject.

"Questioning the book" is a profitable practice to establish. It insures a definite attack upon the lesson.

The aim of this chapter is to point to the conclusion that the study period is the center around which the exercises of the class should be planned, and that the recitation should be devoted primarily to preparing for an effective use of the study period. This implies that supervision of study is the teacher's primary business, the character and extent of the direction given the pupils being determined by the degree of effective independence they have achieved.

References

BAGLEY, WILLIAM C. "Classroom Management," Chapter VIII, The Macmillan Co., New York.

BORASS, JULIUS S. "Teaching to Think," The Macmillan Co., New York.

COLVIN, STEPHEN S. "Introduction to High School Teaching," The Macmillan Co., New York.

DEWEY, JOHN. "How We Think," D. C. Heath & Co., New York.

EARHART, LIDA B. "Teaching Children to Study," Houghton Mifflin Co., Boston.

KITSON, HARRY D. "How to Use Your Mind," J. B. Lippincott Co., Philadelphia.

MCGREGOR, ANNE LAURA. "Supervised Study in English for Junior High School Grades," The Macmillan Co., New York.

MCMURRY, FRANK M. "How to Study and Teaching How to Study," Houghton Mifflin Co., Boston.

SANDWICK, RICHARD. "How to Study and What to Study," D. C. Heath & Co., New York.

STRAYER, GEORGE D. "Brief Course in the Teaching Process, Chapter VIII, The Macmillan Co., New York.

SUMNER, STEPHEN C. "Supervised Study in Mathematics and Science," The Macmillan Co., New York.

SWAIN, GEORGE F. "How to Study," McGraw-Hill Book Co., New York.

WILSON, HARRY B. "Training Pupils to Study," Warwick & York, Inc., Baltimore.

ZIMMERS, PETER J. "Teaching Boys and Girls How to Study," Parker Educational Co., Madison, Wis.

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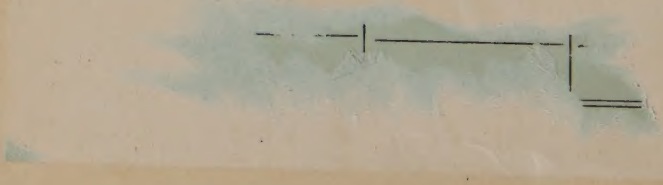

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